PRISM 3030

34-00208.L
September 2003

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FCC Requirements

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user is required to correct the interference at his own expense.

Shielded cables must be used to ensure compliance with the Class A FCC limits.

Caution: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device comples with Part 15 of the FCC rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

Notice to Users of 1.544 Mbps Service

This equipment complies with Part 68 of the FCC rules. On the rear or bottom of this unit is a label that contains the FCC registration number and other information. If requested, provide this information to the telephone company. The following instructions are provided to ensure compliance with FCC Rules, Part 68.

1 All direct connections to network lines must be made using standard plugs and jacks.

2 The following information may be required by the local telephone company when applying for leased line facilities.

T1

Port ID	SOC	FIC	USOC Jack
1.544 Mbps (SF)	6.0 N	04DU9-BN	RJ-48C
1.544 Mbps (SF) (B8ZS)		04DU9-DN	
1.544 Mbps (ESF)		04DU9-IKN	
1.544 Mbps (ESF) (B8ZS)		04DU9-ISN	

FXO

Port ID	SOC	FIC	USOC Jack
2-Wire Loop Start	9.0 N	02LS2	RJ-48M
2-Wire Ground Start		02GS-2	

E&M

Port ID	SOC	FIC	USOC Jack
Type I E&M Interface	TL31M or E	9.0N	RJ-48M
Type II E&M Interface	TL32M or E		

3 If the unit appears to be malfunctioning, it should be disconnected from the telephone lines until it is learned whether the source of trouble is the equipment or the telephone line. If the equipment needs repair, it should not be reconnected until it is repaired.

4 The unit has been designed to prevent harm to the network. If the telephone company finds that the equipment is exceeding tolerable parameters, it can temporarily disconnect service. In this case, the telephone company provides advance notice, if possible.

5 Under FCC rules, no customer is authorized to repair this equipment. This restriction applies regardless of the warranty status.

6 If the telephone company alters its equipment in a manner that affect the use of this device, it must provide warning so that the customer can arrange uninterrupted service. The customer will be advised of the right to file a complaint with the FCC.

7 The attached affidavit must be completed by the installer.

8 In the event of equipment malfunction, all repairs should be performed by our company or an authorized agent. It is the responsibility of users requiring service to report the need for service to our company or to one of our authorized agents.

FXO only: The ringer equivalence number (REN) can be found on the front panel of the card. If requested, provide this information to the telephone company. The REN is useful to determine the quantity of devices that may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to the incoming call. In most, but not all areas, the sum of RENs of all devices should not exceed five (5). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company

Canadian Emissions Requirements

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

End users should use existing 48-VDC battery sources or a CSA-certified power supply.

Le présent appareil numérique n’émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques (de la class A) prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

Warranty

Verilink's product warranty is included at the back of this document.

Customer Service

Verilink offers the following services:

- Technical Assistance Center for free 24×7 telephone support during installation, maintenance, and troubleshooting at (800) 285-2755 and support@verilink.com
- Web site at www.verilink.com

Returning Products

Verilink’s policy for product returns is provided in the warranty statement at the back of this document.

Safety Precautions

When handling this equipment, follow these basic safety precautions to reduce the risk of electric shock and injury:

- Follow all warnings and instructions marked on the product and in the manual.
- Unplug the hardware from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a slightly damp cloth for cleaning.
- Do not place this product on an unstable cart, stand, or table. It may fall, causing serious damage to the product.
- Slots in the unit are provided for ventilation to protect them from overheating. These openings must not be blocked or covered. Never place this product near a radiator or heat register.
- This product should be operated only from the type of power source indicated on the marking label and manual. If you are unsure of the type of power supply you are using, consult your dealer or local power company.
- Do not allow anything to rest on the power cord. Do not locate this product where the cord will interfere with the free movement of people.
- Do not overload wall outlets and extension cords, as this can result in fire or electric shock.
- Never push objects of any kind into the unit. They may touch dangerous voltage points or short out parts that could result in fire or electric shock. Never spill liquid of any kind on this equipment.
- Unplug the equipment from the wall outlet and refer servicing to qualified service personnel under the following conditions:
  - When the power supply cord or plug is damaged or frayed.
  - If liquid has been spilled into the product.
  - If the product has been exposed to rain or water.
  - If the product has been dropped or if the housing has been damaged.

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D Ordering Numbers

1 GENERAL

Introduction

The Verilink PRISM 3030 supports all data networking needs, from connection of a single front end processor to shared access for video, frame relay, and voice. This approach gives the speed and flexibility of T1 transport through a single point of control. It may be configured for any combination of up to 10 high- or low-speed data ports, up to four 6-channel voice application modules, and a DSX1 drop/insert port for voice/data.

Operating the PRISM 3030 is easy, with a choice of five menu driven interfaces. The front panel LCD display is described in the Operations chapter of this manual. The RS-232 connection to a local or remote terminal is explained in the Terminal Operation chapter. The 8100A Site Controller may be used for large network control or Telnet via LAN connection (refer to the 8100A reference manual).

The unit provides the T1 network connection through an advanced integral ESF CSU. Full performance T1 span monitoring enables early detection and correction of problems before they affect critical applications. The unit provides a wide range of test functions to aid in rapid fault isolation and repair. All the standard loopback functions may be implemented. The unit also responds to in-band fractional loop codes to accommodate fractional T1 service testing by the carrier. The internal BERT allows testing both the network and equipment connections.

The unit is compatible with industry standards to ensure access to any T1-provided service and to permit connection of all equipment quickly and correctly. Innovative design eliminates clocking problems on the high-speed data ports. The unit utilizes flash memory to allow firmware upgrades in the field. This eliminates taking units out of service for an extended time or returning units to the factory for updates.

The unit allows complete control of the DS1 bandwidth with flexible assignment of DS0 channels, allowing the user to program bandwidth as needed for each application.

The integral Ethernet or Token Ring management option provides for wide area LAN connectivity. When connecting local area bridging or routing devices to a T1 network, other CSU/DSUs are out of the LAN management loop. With the PRISM 3030, the critical T1 connection point is under control of the existing SNMP management system, providing seamless integration of LAN and WAN, and eliminating the need for a separate CSU/DSU management system.

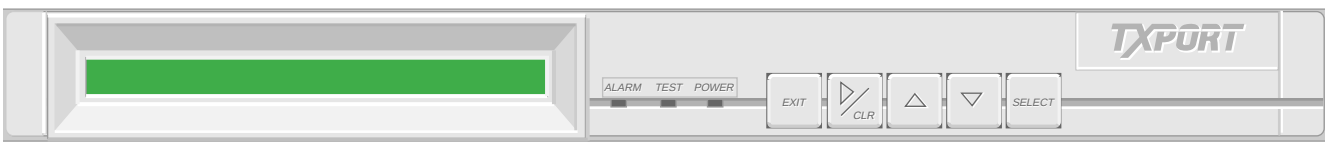


Figure 1-1 Verilink PRISM 3030

The PRISM 3060 is also designed to accept FXS, FXO, and E&M voice application modules, which is the ideal solution for integrating analog voice applications and LAN/WAN applications into fractional or full T1 services. The unit can support up to two voice application modules (for a total of 12 voice applications). All voice module options can be configured from the front panel interface, a terminal connected to the supervisory port, or from a remote 3030 or 3060 unit. If the unit is equipped with an SNMP/Telnet interface, the voice application module can be accessed via a Telnet session from any LAN-connected device.

Features

- Three slots for customer application application modules:
  - Ethernet or Token Ring module with embedded SNMP/Telnet support with optional T1 DTE Port
  - T1 DTE Port (Drop/Insert capabilities)
  - Dual high-speed port application modules (V.35 or EIA-530, synchronous N×56 kbps
    or N×64 kbps)
  - High- and low-speed combination application modules (RS-232/V.35, RS-232/EIA-530, RS-232 synchronous, RS-232/232)
  - FXS (Foreign Exchange Station) voice application module with six independent voice channels per application module
  - FXO (Foreign Exchange Office) voice application module with six independent voice channels per application module
  - 4-Wire E&M Tie Trunks voice application module with six independent voice channels per application module
- Integral ESF/CSU provides full performance monitoring (meets TR 62411, TR 54016, and T1.403 standards)
- D4 or ESF line framing
- AMI or B8ZS line coding
- Supports fractional T1 services with flexible bandwidth allocation
- Built-in BERT function with multiple stress patterns and selectable looping tests; responds to in-band fractional loop code
- Full T1 software management through
  - the front panel LCD interface
  - a VT100-compatible terminal interface
  - Verilink 8100A Site Controller
  - an integral SNMP management interface application module
  - a Telnet session
- Programmable alarm thresholds
- Flash memory allows software upgrades in the field

Specifications

Network Interface

Line Rate:	1.544 Mbps (±50 ppm)
Line Framing:	D4 or ESF
Line Code:	AMI or B8ZS
Input Signal:	0 to −27 dB ALBO
Connection:	RJ-48C jack, 100 Ω (±5%)
Output Signal:	3.0 V (±10%) base-peak into 100 Ω with protection
Line Build Out:	0, −7.5, −15, −22.5 dB attenuation
Transient Voltage:	1000 V protection, fused input and output
Jitter Control:	per TR 62411 and T1.403
Timing Source:	Internal, recovered line clock, external DTE, station clock
Ones Density:	B8ZS, N×56 bit stuffing, alternate fill; complies with TR 62411

Equipment Interface

T1 DTE Port (optional)

Line Rate:	1.544 Mbps (±50 ppm)
Line Framing:	D4 or ESF
Line Code:	AMI or B8ZS
Input Signal:	DSX1 to −6 dB
Connection:	RJ-48C jack, 100 Ω (±5%)
Output Signal:	Selectable DSX1 level from 0 to 655 feet in six incremental levels

DTE Slots 2A through 3B

Compatibility:	EIA-530 (RS-422), female DB-25; ITU V.35, female 34-pin; EIA-232, female DB-25
Data Rate:	Synchronous, N×56 kbps or N×64 kbps (where N=1 to 24); independent selection on each port
Clocking:	Internal, External, or Oversample
Data Invert:	Independent selection on each port

Voice application modules (optional)

FXS

Applications:	FXS (Foreign Exchange Station), In WATS, Out WATS, Auto Ringdown, Universal Voice Grade (UVG; Requires Verilink equipment at each end.), Direct Inward Dialing (DID), Dialed Number Identification Service (DNIS), Loop Start DNIS (LS-DNIS), Ground Start DNIS (GS-DNIS), Automatic Number Identification (ANI), and Custom Local Area Signalling Service (CLASS)
Connector:	AMP 50-pin (25 pairs), female
Signalling:	Loop, Ground, MEGACOM®, SLC®96

Encoding:	PCM six ports per application module
Power/Ring:	Internal
Transmit Gain:	−4.0 dB fixed
Receive Gain:	−11 dB to 0 dB

FXO

Applications:	FXO (Foreign Exchange Office), Extends PBX Service providing remote users with Off Premises Extension (OPX), Universal Voice Grade (UVG; Requires Verilink equipment at each end.), Direct Inward Dialing (DID), Dialed Number Identification Service (DNIS), Automatic Number Identification (ANI), and Custom Local Area Signalling Service (CLASS)
Connector:	AMP 50-pin (25 pairs), female
Signalling:	Loop, Ground
Encoding:	PCM six ports per application module
Power/Ring:	Internal
Transmit Gain:	−6 dB to 0 dB
Receive Gain:	−6 dB to 0 dB

4-Wire E&M

Applications:	4-Wire E&M Tie Trunks, PBX - Point to Network, PBX - Point to Point, TO (transmission only)
Connector:	AMP 50-pin (25 pairs), female
Signalling:	Type I, II, III, TO (p/n F-3010-200--112) Type I, II, III, IV, V, TO (p/n F-3010-200--114)
Encoding:	PCM six ports per application module
Power/Signalling:	Internal −48 VDC
Transmit Gain:	−14 dB to +2 dB
Receive Gain:	−18 dB to −1 dB

Ethernet Interface

Network Protocol:	TCP/IP-based networks
Data Rate:	10 Mbps
Connection:	RJ-45 (compliant with IEEE 802.3 Ethernet standards)
Compatibility:	10BASE-2, 10BASE-5, and 10BASE-T
Standards:	ISO/IEC 8802.3 (Ethernet)
MIB-II:	Device identification and interface performance data. All applicable objects and reporting traps maintained.
DS1 MIB:	DS1 network interface configuration, performance objects, and alarm reporting traps are maintained.

	Interface Standards:	Internet RFC 1157 (SNMP) RFC 1213 (MIB-II) RFC 1406 (DS1 MIB)
Token Ring Interface	Network Protocol:	TCP/IP-based networks
	Data Rate:	4 or 16 Mbps
	Connection:	Female DB-9
	Compatibility:	Type 1 shielded twisted pair (STP) networks and Type 3 unshielded twisted pair (UTP) networks (with adapter)
	Standards:	ISO/IEC 8802-5 (Token Ring)
	MIB-II:	Device identification and interface performance data. All applicable objects and reporting traps maintained.
	DS1 MIB:	DS1 network interface configuration, performance objects, and alarm reporting traps are maintained.
	Interface Standards:	Internet RFC 1157 (SNMP) RFC 1213 (MIB-II) RFC 1406 (DS1 MIB)
Diagnostics	Performance:	Monitoring per TR 54016 and T1.403
	Network Loops:	Line loopback or payload loopback
	Fractional Loop:	Responds to in-band V.54 loop code
	DTE Port Loops:	Loop toward DTE or network
	BERT:	Multiple test patterns toward network or DTE ports
Alarms	Activation:	Programmable thresholds
	Reporting:	Call out on alarm (COA), NO/NC dry contacts, 8100A Site Manager, trap messages
	Contact Ratings:	0.6 A at 125 VAC, 2.0 A at 30 VDC
Power	F-3030-001--1111:	110 VAC: 0.5 A, 28 W, 95 BTU max
	F-3030-001--1121:	220 VAC: 0.25 A, 28 W, 95 BTU max
	F-3030-001--1141:	48 VDC: 0.583 A, 28 W, 95 BTU max
Mechanical	Mounting:	Desktop, horizontal rack, or wall mount
	Dimensions:	17.5" W, 1.75" H, 12.5" D
	Weight:	8 pounds
Environmental	Operating Temp:	0° to 50°C (32° to 122°F)
	Storage Temp:	−20° to 85°C (−4° to 185°F)
	Humidity:	95% maximum (non-condensing)

Compatibility

TR 62411:	December 1990
TR 41458:	April 1990 (where applicable)
TR 54016:	September 1989
T1.403:	1989
TR 54019A:	April 1988

Industry Listings

FCC Compliance:	Part 15 Subpart B, Class A, Part 68
Industry Canada:	CS-03
US Safety:	UL1459, 2nd Edition
Canadian Safety:	CSA C22.2, No. 225-M90

2 INSTALLATION

Introduction

This chapter contains information and instructions required to prepare the Verilink PRISM 3030 for use. Included are initial inspection procedures, mounting instructions, configuration guidelines, connection, and powering information.

The unit is shipped ready for desktop or horizontal rack mount use. Mounting brackets are attached at the front edge of the unit. These may be removed for desktop use.

Safety Summary

This manual contains information and warnings that must be followed by the user to ensure safe operation and to retain the equipment in a safe condition.

⚠ *This WARNING sign denotes a potential hazard to the operator. It calls attention to a procedure or practice that, if not correctly performed or adhered to, could result in injury or loss of life. Do not proceed beyond a WARNING sign until the indicated conditions are fully understood and met.*

⚠ *CAUTION: Option modules are susceptible to damage caused by static electricity. Use ESD (electrostatic device) precautionary measures, such as wearing static grounding straps and storing modules in the supplied anti-static bags.*

Unpacking and Inspection

This unit is carefully packaged to prevent damage in shipment. Upon receipt, inspect the shipping container for damage. If the shipping container or cushioning material is damaged, notify the carrier immediately and make a notation on the delivery receipt that the container was damaged (if possible, obtain the signature and name of the person making delivery). Retain the packaging material until the contents of the shipment have been checked for completeness and the instrument has been checked both mechanically and electrically.

If the contents of the shipment are incomplete or, if there is mechanical damage or defect, notify Verilink. If the shipping container is also damaged, or the cushioning material shows signs of stress, notify the carrier of the damage as well as Verilink. Keep the shipping materials for the carrier's inspection. Verilink will arrange for repair or replacement without waiting for claim settlement.

Supplied Materials

The PRISM 3030 is shipped from the factory with the following standard equipment:

- Attached 19-inch mounting brackets
- The PRISM 3030 reference manual
- AC power supply cord for AC-powered units

For specific applications, the user may require additional cables and adapters for the installation and operation of the unit. The interface requirements of any application may be met by using the appropriate cable. Standard cables and Verilink ordering numbers are listed in Ordering Numbers on page 121. Contact Verilink for any needed assistance in cable selection.

Application Module Installation

The modular architecture of the PRISM 3030 provides the capability for adding or changing module options as shown in PRISM 3030 Rear Panel on page 9. Several interface modules are available for high- or low-speed data and voice. These modules fit in rear panel Slots 2 and 3. Ordering Numbers on page 121 shows ordering information.

Options are also available to provide the unit with a T1 DTE interface. This interface may be equipped with the Ethernet or Token Ring SNMP network management option. These modules only fit in Slot 1. See Ordering Numbers on page 121 for ordering information.

⚠ *To prevent electric shock or damage to the unit, turn the rear panel power switch Off before removing or installing any option modules.*

To add a module to an empty slot, power the unit off and remove the cover plate which is held in place by one or two screws. Carefully slide the new application module along the guides with the component side facing down. Push the board in until the faceplate rests against the rear panel. Replace the screws.

If resistance is encountered when inserting the application module, remove the application module and verify that there are no obstructions in the path. Also check for bent or damaged pins in the connectors on both the module and the chassis.

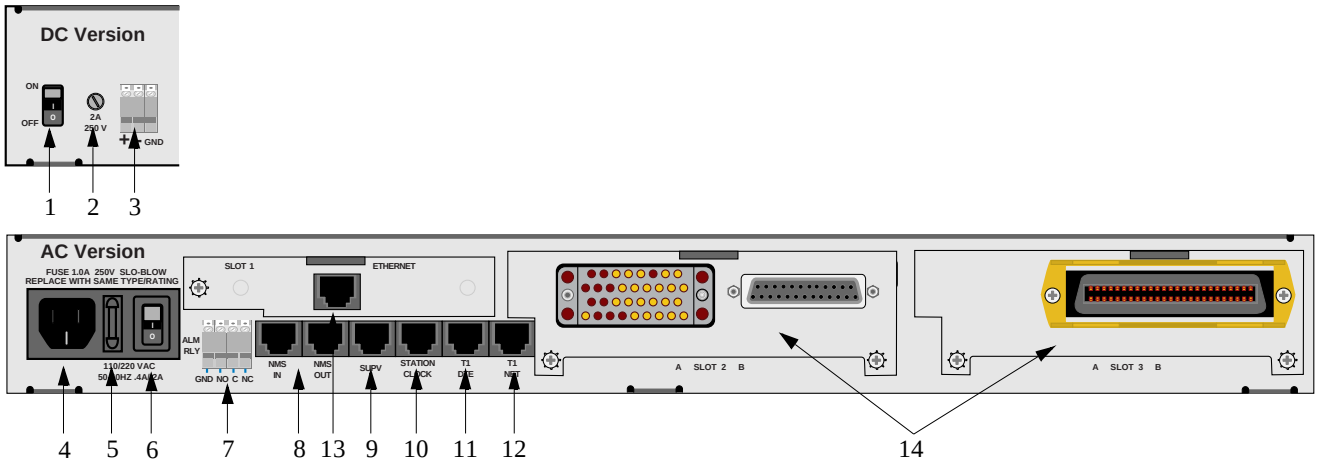


Figure 2-1 PRISM 3030 Rear Panel

Table 2-1 PRISM 3030 Rear Panel Connectors and Switches

Index	Item	Function
1	DC Power Switch	This switch turns the DC power ON or OFF.
2	DC Fuse	This DC fuse is rated at 2.0 amperes.
3	DC Connection	48 VDC power is connected to + and —. See DC Power Connection Procedure on page 19.
4	AC Connection	This 110/220 VAC power receptacle is rated at 50–60 Hz, 0.6 A/0.3 A. See AC Power Connection on page 18.
5	AC Fuse	This AC fuse is rated at 1.0 ampere and is shipped with a spare.
6	AC Power Switch	This switch controls the AC power (position I is ON and position O is OFF).
7	Alarm Relay	The Normally Closed alarm connects to NC & C. The Normally Open alarm connects to NO & C.
8	NMS	This is the network management system input/output. Refer to NMS Connection on page 15.
9	SUPV	Supervisory port connection. Refer to Supervisory Port Connection on page 16.
10	Station Clock	The N×56/64 kHz or 1.544 MHz external station clock connector. Refer to External Clock Connection on page 14.
11	T1 DTE	The T1 DTE port for drop and insert applications. Refer to 3010 Module Options on page 13.
12	T1 NET	The T1 network port. Refer to Network Connection on page 13.
13	Slot 1 - Ethernet	The Ethernet or Token Ring connection. Refer to LAN SNMP Connection on page 17.
14	Slots 2 and 3	Two application modules with up to two ports each may be inserted into each of these slots. In this example, Slot 2 shows a combination V.35 and EIA-530 application module. Slot 3 shows an FXS voice application module.

Unit Configuration

Hardware switch settings are not required on this unit. Configuration is performed using any of the following methods:

- The front panel LCD interface (refer to the Operation chapter of this manual).
- A terminal connected to the SUPV or the NMS port (refer to the Terminal Operation chapter).

The unit provides non-volatile memory retention of unit configuration in the event of power failure. This feature allows the unit to automatically restore normal service following a power loss. Note, however, that when the unit is stored without power for an extended period, the battery may drain and some parameters may become corrupted.

Therefore, when the unit is first received for installation or if power has not been applied for an extended period of time, a factory-default maintenance reset operation should be performed on the unit. Refer to the procedures detailed in Maintenance Reset on page 22.

Data Port Connections

The unit is available with 1 to 10 high-speed data ports installed in Slots 2 and 3 on the rear panel (see PRISM 3030 Rear Panel on page 9). Each slot may contain one application module. The data ports are configured as data communications equipment (DCE) for connection to data terminal equipment (DTE) and may be equipped with any combination of V.35- or EIA-530-compatible interfaces. Pin assignments for both the V.35 and EIA-530 interfaces are given in Appendix A.

⚠ *Caution: FCC rules require that interconnecting cables carrying high-speed data be shielded appropriately to minimize radio frequency interference.*

Voice Application Module Connection

The FXO, FXS, and 4-Wire E&M Voice application modules support six ports that can be used to interface analog telephones, key systems, and PBXs to a T1 facility (DS0).

Connection to each type of voice application module is made through a rear-panel 25-pair female connector, retained by a loop-and-hook fastener strap. Refer to Table 2-2, Table 2-3, and Table 2-4 for connection information.

FXO line build out jumper choices are AT&T Compromise and 900 Ω. Set the jumper pairs the same way for each channel. Using Figure 2-2 as a reference, AT&T Compromise has the jumper set on the center and right pins. 900 Ω has the jumper set on the center and left pins. The default setting is AT&T Compromise.

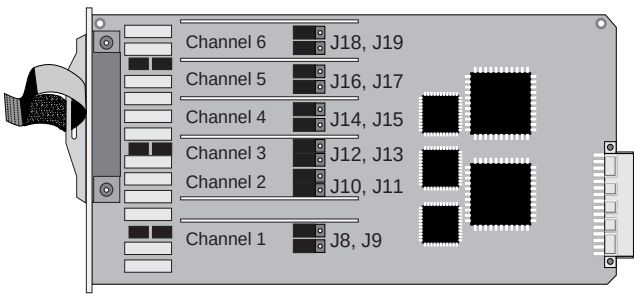


Figure 2-2 FXO Showing the Channel Jumpers

Table 2-2 Wiring for FXO Application Module

Pair	Pin #	Color	FXO Function
1	26 1	White/Blue Blue/White	Circuit #1
2	27 2	White/Orange Orange/White	Circuit #2
3	28 3	White/Green Green/White	Circuit #3
4	29 4	White/Brown Brown/White	Circuit #4
5	30 5	White/Slate Slate/White	Circuit #5
6	31 6	Red/Blue Blue/Red	Circuit #6
25	50 25	Violet/Slate Slate/Violet	–48 VDC VDC Return

Table 2-3 Wiring for FXS Application Module

Pair	Pin #	Color	Function
1	26 1	White/Blue Blue/White	Circuit #1
2	27 2	White/Orange Orange/White	Circuit #2
3	28 3	White/Green Green/White	Circuit #3
4	29 4	White/Brown Brown/White	Circuit #4
5	30 5	White/Slate Slate/White	Circuit #5
6	31 6	Red/Blue Blue/Red	Circuit #6

Table 2-4 Wiring for the 4-Wire E&M Application Module

Pair	Pin	Color	4-Wire Function	Circuit
1	26	White/Blue	Audio In Tip	Circuit #1
	1	Blue/White	Audio In Ring	
2	27	White/Orange	Audio Out Tip	
	2	Orange/White	Audio Out Ring	
3	28	White/Green	E Lead	
	3	Green/White	Signal Ground	
4	29	White/Brown	M Lead	
	4	Brown/White	Signal Battery	
5	30	White/Slate	Audio In Tip	Circuit #2
	5	Slate/White	Audio In Ring	
6	31	Red/Blue	Audio Out Tip	
	6	Blue/Red	Audio Out Ring	
7	32	Red/Orange	E Lead	
	7	Orange/Red	Signal Ground	
8	33	Red/Green	M Lead	
	8	Green/Red	Signal Battery	
9	34	Red/Brown	Audio In Tip	Circuit #3
	9	Brown/Red	Audio In Ring	
10	35	Red/Slate	Audio Out Tip	
	10	Slate/Red	Audio Out Ring	
11	36	Black/Blue	E Lead	
	11	Blue/Black	Signal Ground	
12	37	Black/Orange	M Lead	
	12	Orange/Black	Signal Ground	
13	38	Black/Green	Audio In Tip	Circuit #4
	13	Green/Black	Audio In Ring	
14	39	Black/Brown	Audio Out Tip	
	14	Brown/Black	Audio Out Ring	
15	40	Black/Slate	E Lead	
	15	Slate/Black	Signal Ground	
16	41	Yellow/Blue	M Lead	
	16	Blue/Yellow	Signal Ground	
17	42	Yellow/Orange	Audio In Tip	Circuit #5
	17	Orange/Yellow	Audio In Ring	
18	43	Yellow/Green	Audio Out Tip	
	18	Green/Yellow	Audio Out Ring	
19	44	Yellow/Brown	E Lead	
	19	Brown/Yellow	Signal Ground	
20	45	Yellow/Slate	M Lead	
	20	Slate/Yellow	Signal Ground	
21	46	Violet/Blue	Audio In Tip	Circuit #6
	21	Blue/Violet	Audio In Ring	
22	47	Violet/Orange	Audio Out Tip	
	22	Orange/Violet	Audio Out Ring	
23	48	Violet/Green	E Lead	
	23	Green/Violet	Signal Ground	
24	49	Violet/Brown	M Lead	
	24	Brown/Violet	Signal Ground	
25	50	Violet/Slate	not used	
	25	Slate/Violet	not used	

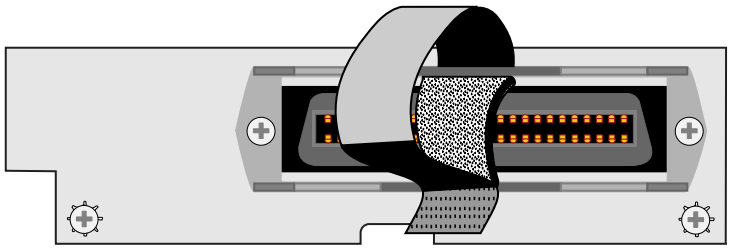


Figure 2-3 3010 Module Options

Table 2-5 Voice Application Module Part Numbers

Voice Module Type	Part Number
6-Port FXS	F-3010-200A-111
6-Port E&M	F-3010-200--112 F-3010-200--114
6-Port FXO	F-3010-200A-113

T1 DTE Connection

The unit is supplied with a T1 DTE jack, that functions only if the unit is equipped with the T1 DTE interface application module (in Slot 1). This function provides a DSX1-level interface which allows the user to pass DS0 channels through the unit from the network side to other T1-oriented equipment via the T1 DTE port.

A typical installation divides the channel usage so that DS0 channels carrying high-speed data are mapped to the high-speed data ports while all other channels are passed through to meet other application requirements.

The DTE DSX1 line build out level should be set as shown in DSX Level in DSX Level on page 27. The T1 DTE physical interface is a standard RJ-48C connector with the following pinout.

Table 2-6 T1 DTE Connector Pinout

Pin	T1 DTE Interface
1, 2	Data Out
3, 6	Not Used
4, 5	Data In
7, 8	Chassis Ground

Network Connection

The network side of the unit is referred to as the network interface. This interface contains an ALBO (automatic line build out) that allows the unit to be located a substantial distance away from the telco network interface with a receive signal level to –27 decibels.

The network interface LBO level should be set as instructed in Line Build Out on page 25. Maximum suggested cable lengths for the connection from the unit to the network are listed in the following table. Calculations are based on a cable temperature of 70°F, 0.083 µF/mile capacitance, a 27-dB loss, and a 100-Ω, non-loaded, twisted pair cable. PIC refers to Plastic Insulated Cable.

Table 2-7 Network Cable Characteristics

Cable Type	Loss per 1000'	Max Cable Length
26 gauge PIC	6.8 dB	4,400 ft
24 gauge PIC	5.4 dB	5,500 ft
22 gauge PIC	4.2 dB	7,100 ft
19 gauge PIC	3.0 dB	10,000 ft

The network physical interface is a standard RJ-48C connector with the following pinout assignments.

Table 2-8 T1 Net Connector Pinout

Pin	T1 NET Interface
1, 2	Data In
3, 6	Not used
4, 5	Data Out
7, 8	Chassis Ground

Network Disconnection

In accordance with FCC Rules, Part 68.218(b), the user must notify the telephone company prior to disconnecting the unit.

Alarm Connection

Alarm conditions detected by the unit are conveyed at the isolated Alarm Relay output contacts on the rear panel. NC (Normally Closed) and NO (Normally Open) refer to the alarm contact's relationship to C (Common) under a no alarms condition.

Alarm connections are made to the terminal strip using a 22-gauge stranded, or similar wire. The Normally Closed alarm connects to NC & C. The Normally Open alarm connects to NO & C. Contacts are rated at 0.6 amperes AC or 2.0 amperes DC. Alarm parameters are discussed in Alarm Parameters on page 64.

External Clock Connection

If the unit is to receive its timing source from a user supplied clock other than the DTE or T1 lines, the Station Clock input must be connected on the rear panel. This input is designed to accept TTL or bipolar signal levels. The station clock is commonly available as a 64 kHz, bipolar RTZ signal referred to as a *composite clock*.

The unit also accepts any unframed all ones bipolar RTZ signal with a level of 1.5 to 4 volts peak and a frequency of 1.544 MHz or any multiple of 56 or 64 kHz. An RS-423 compatible station clock input, with the same range of input frequencies, is also available as an option.

The station timing is configured through the front panel (see Station Timing on page 25) or through the terminal interface (see Station Timing on page 61). Pin utilization is shown in the following table.

Table 2-9 TTL and Bipolar External Clock Connector Pinout

Pin	TTL Signal	Bipolar Signal
1, 6	Ground	Ground
2, 5	Not Used	Not Used
3	TTL Clock	Balanced Tip
4	Ground	Balanced Ring

Network Management

The unit is fully compatible with the Verilink Site Manager, the 8100A. The 8100A software system can be used to manage small to large networks of network access products.

NMS Connection

The two 6-pin modular connectors labeled NMS IN and NMS OUT on the rear panel may be used for connection to the 8100A. This port is configured in this manner to allow the connection of multiple collocated units in a daisy chain IN/OUT bus arrangement as shown in Figure 2-4. The OUT port of one element is connected to the IN port of the next element, and so on, to form a complete chain among the group of elements.

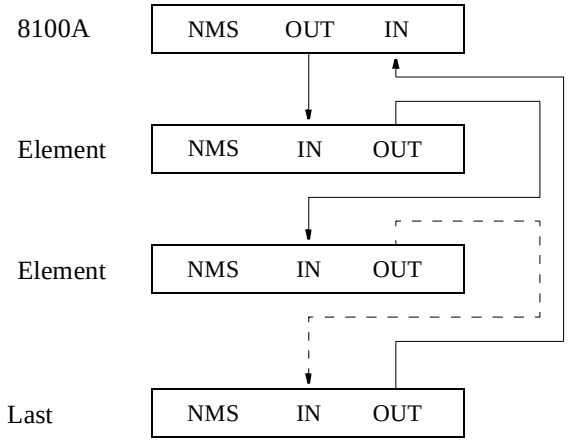


Figure 2-4 NMS Daisy-Chain Arrangement

All units on the same NMS chain must use the same NMS bit rate.

The NMS IN connector provides both the transmit and receive signal pair. This port may be used for a modem connection or as a VT100 terminal interface (refer to chapter Terminal Operation on page 45).

The NMS address, NMS bit rate, and boot configuration mode are set by the front control panel as described in page 42. The physical connection of the NMS port is a 6-pin modular connector with the pinout shown in Table 2-10. This is a serial RS-232 level port configured for 8 bits, no parity, and 1 stop bit.

Table 2-10 NMS In and Out Pinouts

Pin	NMS BUS IN	NMS BUS OUT
1, 6	Not Used	Not Used
2, 5	Signal Ground	Signal Ground
3	Data Out	Data Out
4	Data In	Not Used

Supervisory Port Connection

The rear panel SUPV port serves several functions. The terminal interface program may be accessed through this port. A modem may be connected to this port for remote access or use of the call on alarm feature (see Figure 2-5).

The supervisory port is an independent serial interface into the unit and plugging into it does not interrupt the NMS port traffic. The supervisory port bit rate must be set by the front control panel (see System Utilities on page 41).

The physical connection is a 6-pin modular jack with the following pinout assignments. The port is a serial RS-232 level port configured for 8 bits, no parity, and 1 stop bit.

Table 2-11 SUPV Port Pinout

Pin	SUPV Port Interface
1	Control Out
2, 5	Signal Ground
3	Data Out
4	Data In
6	Control In

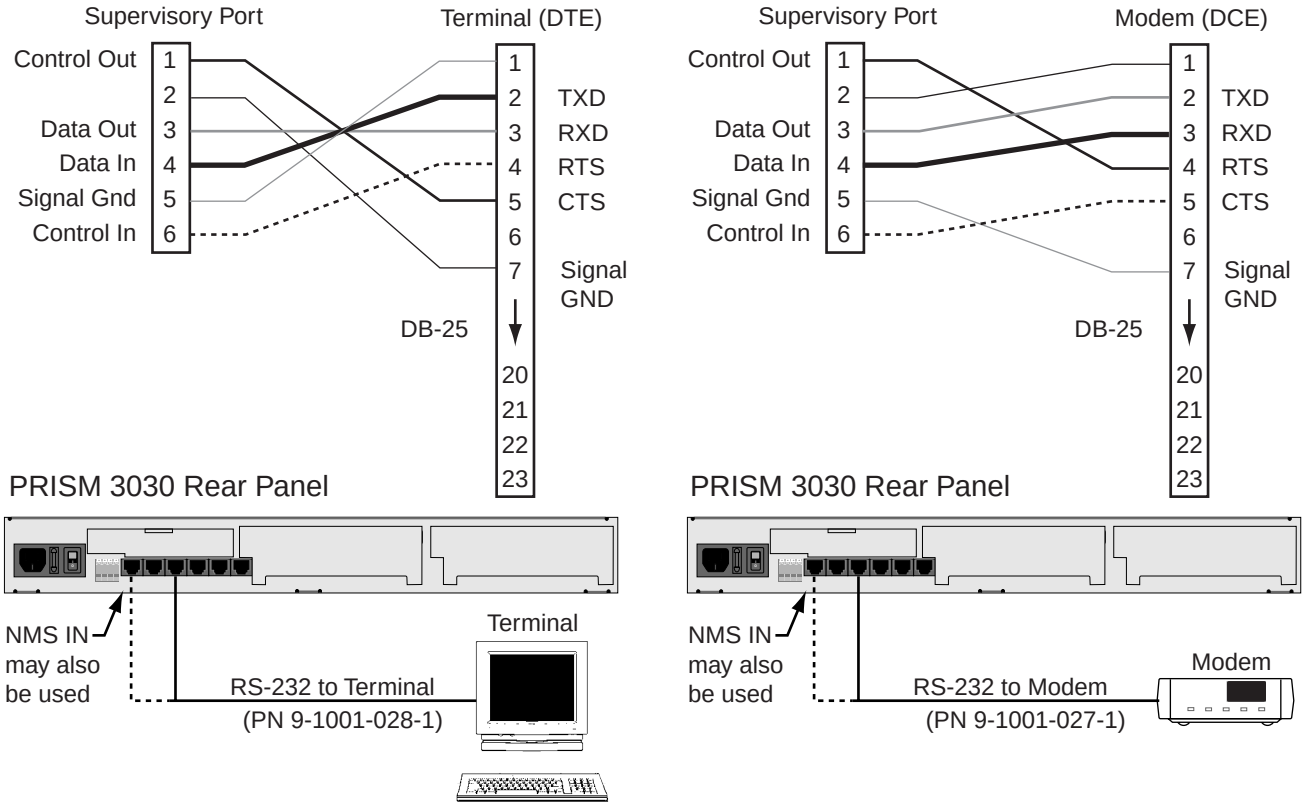


Figure 2-5 Supervisory Port to Terminal and Supervisory Port to Modem Connections

LAN SNMP Connection

The unit may be equipped with an optional Ethernet or Token Ring interface for connection to the user's LAN (local area network). The unit's SNMP (Simple Network Management Protocol) agent can then be programmed to take advantage of the centralized status monitoring and alarm reporting capability of SNMP managed networks. The LAN interface is connected to Slot 1 on the rear panel.

Ethernet

The Ethernet interface is compliant with the 802.3 standard and is presented on an RJ-45 connector. The pinout is shown in Table 2-12.

Table 2-12 Ethernet Connector Pinout

Pin	Ethernet Interface
1	Transmit Data +
2	Transmit Data –
3	Receive Data +
6	Receive Data –
4, 5, 7, 8	Spare

Token Ring

The Token Ring interface is designed to operate on both 4 and 16 Mbps networks. For 4 Mbps operation, jumper J3 must be strapped across pins 1 and 2. For operation at 16 Mbps, jumper J3 must be strapped across pins 2 and 3. The Token Ring interface consists of a 9-pin female connection compatible with shielded twisted pair (STP) cable and complies with ISO/IEC 8802-5 (formerly IEEE 802.5). The pinout assignments are as follows.

Table 2-13 Token Ring Connector Pinout

Pin	Token Ring Function
1	Data In (A)
6	Data In (B)
9	Data Out (A)
5	Data Out (B)
3	+5 volts
2, 4, 7, 8	Signal Ground
Shell	Chassis Ground

Connection to unshielded twisted pair (UTP) cable may be accomplished using an appropriate STP to UTP media filter/ adapter (Verilink PN 9-1001-056-1). After connection to the Token Ring LAN, the unit must be powered down and then back up to allow the interface to perform a self test on the network.

Power Connection

The unit is factory equipped for one of three powering options as required by the user. The 110 VAC version is supplied with a standard three-prong AC cord. The 220 VAC version is supplied with an unterminated cord. Both AC versions are fused at 1.0 ampere.

The DC power version is equipped with terminal blocks for power connection and is fused at 2.0 amperes. In all cases, a proper ground should be connected to the GND terminal.

Remove power before checking fuses.

On power up, the board initialization sequence causes a delay. During this period, the message on the front panel shows Calculating Checksum. Each voice application module adds six seconds to the delay.

AC Power Connection

1. Connect the AC power cord to an appropriate AC power receptacle.
2. Set the rear panel power ON/OFF switch to the ON position (labeled **I**). The green power LED on the front panel should light after the LED initialization sequence ends. If the indicators do not light, recheck the power connections and the primary AC circuit breaker. Make sure the ON/OFF switch is in the ON position.

DC Power Connection Procedure

Connect the ground lead before applying power to the unit.

1. Connect a ground lead using 18- to 20-gauge wire to the terminal labeled GND. Refer to PRISM 3030 Rear Panel on page 9.

2. Connect the positive 48 VDC lead using 22-gauge wire to the terminal labeled +. Connect the −48 VDC lead to the terminal labeled –.

3. Set the rear panel power switch to the On position. The green power LED on the front panel should light, then the LED initialization sequence should begin. If the indicators do not light, recheck the power connections and make sure the ON/OFF switch is in the ON position.

3 OPERATION

Introduction

This chapter describes the screens and menus associated with the Verilink PRISM 3030 front panel LCD interface. The Terminal Operation chapter discusses the screens and menus associated with the external terminal interface. In general, the options are the same for both interfaces.

Figure 3-1 depicts the front panel which has three LED indicators, an LCD screen, and five control buttons. Table 3-1 is referenced by number to the front panel controls and indicators along with a brief description.

Table 3-1 Front Panel Controls and Indicators

Index	Control/Indicator	Function
1	LCD Display	This 2-line, 40-character wide window provides access to unit configuration, diagnostics, and utilities.
2	ALARM (red)	This LED lights continuously when the unit is in an active alarm condition.
3	TEST (yellow)	This LED lights continuously when line or DTE loops are set or if the BERT function is operating.
4	POWER (green)	This LED lights continuously when power is applied to the unit.
5	EXIT	Pressing this button returns the program to the previous menu.
6	▶/CLR	Pressing this button either moves the cursor one character to the right or it clears the error counts. Pressing this button on power up resets all parameters to the factory defaults.
7	▲	Pressing this button scrolls the program up through the elements/parameters.
8	▼	Pressing this button scrolls the program down through the elements/parameters.
9	SELECT	Pressing this button accesses a submenu or sets a parameter to the displayed value.

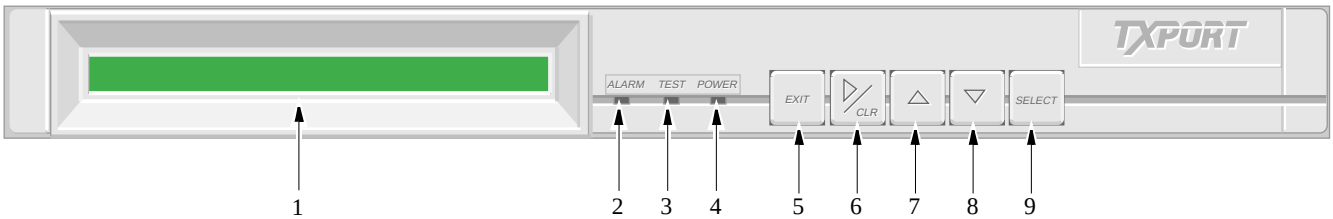


Figure 3-1 3030 Front Panel

Throughout this manual, all the factory default settings are shown underlined.

Front Panel Operation

After power is applied and the unit performs a self test, the idle display screen appears as shown in Figure 3-2. The top display line is text that can be user programmed (see User Info/Unit ID on page 42). The bottom line displays the unit serial number and the hardware/software revision numbers. The unit can be accessed by pressing any front panel key.

Maintenance Reset

The PRISM 3030 provides non-volatile memory retention of unit configuration in the event of power failure. This feature allows the unit to automatically restore normal service following a power loss. Note, however, that when the unit is stored without power for an extended period, the battery drains and some parameters might become corrupted.

Therefore, when the unit is first received for installation or if power has not been applied for an extended period, a factory default maintenance reset operation should be performed. This is done by pressing and holding the CLR button and then applying power to the unit. Hold this key until the RAM CLEARED message appears. This procedure installs the predefined ROM configuration to eliminate the possibility of data corruption. The battery is fully charged after power has been applied for 120 hours.

The maintenance reset operation sets all parameters to the factory default ROM settings and zeros all performance registers.

Password

If no password has been programmed, the password prompt does not appear and the PRISM 3030 proceeds directly to the menu system. The unit is factory shipped without a programmed password. The process of setting a password is described in Edit Password on page 41.

If a password has been programmed, the password screen appears when any key is pressed. Each character must be entered using the up and down arrow keys until the desired character is displayed. Using the up arrow, the characters scroll 0 through 9, A through Z, and a through z for a total of 62 distinct characters. When the correct character is displayed, press the right arrow to move the cursor to the next position. The preceding character is accepted and disappears.

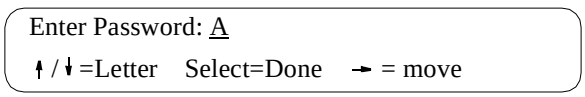


Figure 3-2 Password Screen

Continue this pattern until the last character is selected. Press the right arrow once more and then press Select. If the password is correct, the unit advances into the menu system. If the password is entered incorrectly, the idle display is returned and another attempt can be made.

The password is case sensitive. Lower case and upper case characters must be entered exactly as they were programmed.

Menu Components

The PRISM 3030 front panel display consists of three components: a menu title, a menu element, and a cursor.

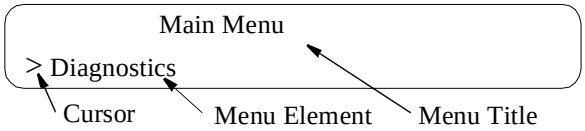


Figure 3-3 Main Menu Screen

These components are shown in the following screen using the Main Menu as an example.

Menu Title

The menu title is the general classification of user-accessible functions.

Menu Element

There are three types of menu elements. In this manual, the distinction is made by the box type shown in the menu diagrams.

- A large, solid box indicates user-selectable menus with lower level menu items.
- A dashed box lists user selectable parameters. Pressing Select executes the displayed configuration.
- A small, solid box (with small type) indicates either a non-selectable status or a field in which a particular value can be entered.

For example, refer to Main Menu on page 24. The upper level menus are shown within a large, solid box. This indicates that these items are user-selectable menus. The lower level menus are shown within dashed boxes to indicate that these items are user-selectable parameters. The small, solid boxes under Alarm Thresholds indicate that values can be entered in these fields.

If the menu element contains a submenu, it is accessed by pressing Select. The menu element becomes the menu title and the next lower level in the hierarchy becomes the menu element. For example, if the menu element is T1 NET Configuration, pressing Select moves T1 NET Configuration up to the menu title level and Framing Type moves up to the menu element level.

Cursor

The cursor first appears on the left side of the display as seen in the upper screen of Figure 3-4. When the element is a user-selectable function, pressing Select moves the cursor to the right with the arrow pointing left (<) as seen in the lower screen.

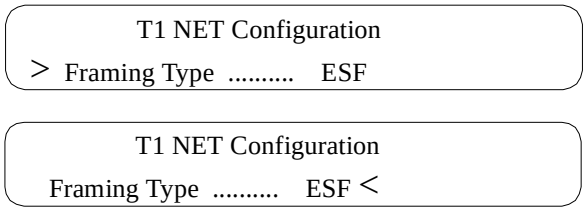


Figure 3-4 Example of Cursor Movement

This allows scrolling through the options available for that function using the arrow keys. Pressing Select again sets that parameter. Pressing Exit returns the cursor to the left. The cursor does not appear when status-only elements are displayed.

To return to the previous screen without changing a parameter, press Exit. Do not press Select. Pressing Exit again returns the previous screen.

Main Menu Display

The Main Menu screen is the first level of user-accessable functional menus available. To activate any of these menus or submenus, use the methods described in Menu Components on page 23.

The Main Menu diagram is shown in Figure 3-5. The section and page numbers are provided to refer to a specific topic.

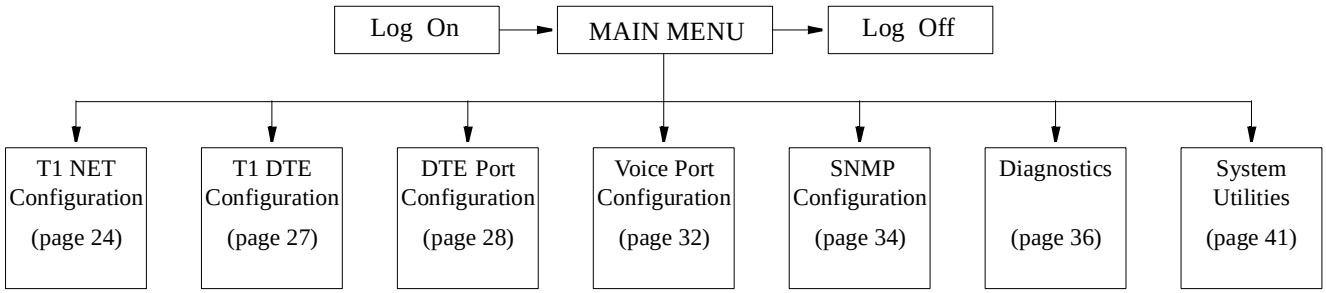


Figure 3-5 Main Menu

T1 NET Configuration

The T1 NET Configuration screen allows the following network configuration parameters to be set.

Defaults are shown underlined.

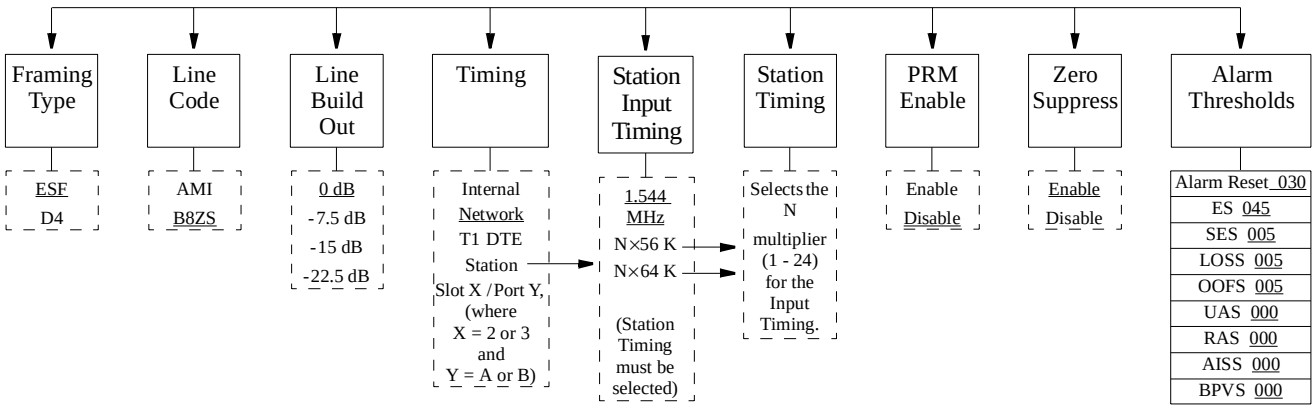


Figure 3-6 T1 NET Configuration Menu

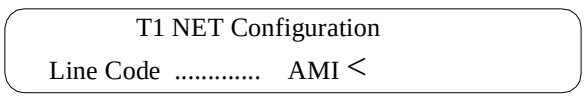


Figure 3-7 T1 NET Configuration Screen

Framing Type Selects the framing for the network side of the DSU/CSU. The choices are D4 and ESF.

Line Code Sets the network side line coding. The choices are AMI and B8ZS.

Line Build Out Sets the line build out for the network interface. The choices are 0 dB, -7.5 dB, -15 dB, and -22.5 dB.

Timing Sets the timing source to synchronize the unit's internal timing generators. In all cases, slips are controlled to occur on frame boundaries at the network and/or DSX1 ports when timing synchronization is lost. The choices are as follows.

INTERNAL

The unit's internal frequency standard is used for all timing.

NETWORK

Timing is derived from the network recovered clock (the most common selection for most applications).

T1 DTE

The unit synchronizes to the clock recovered from the DSX1 T1 DTE port. This selection only appears on units equipped with the T1 DTE option.

STATION

Timing is derived from a bipolar- or TTL-compatible clock supplied to the unit through the rear panel

STA CLK Connector

When this mode is selected, the timing rate must also be set from Station Input Timing.

SLOT X, PORT Y

Timing is synchronized to the external terminal timing clock supplied from the DTE and connected to the selected port. Selections only appear for ports installed in the unit. Ports are indicated as Slot X/Port Y, where X= 2 or 3 and Y=A or B.

Station Input Timing Selects the input timing and only appears when Station has been selected from the Timing menu. The choices are N×56K, N×64K, and 1.544 MHz.

Station Timing Selects the N multiple when Station Input Timing is set to either N×56K or N×64K and only appears when Station has been selected from the Timing menu. The N range is 1 to 24. For example, if N=2 and Station Input Timing is set to N×64K, the unit expects a 128 kHz clock on the station input port (2×64 = 128).

PRM Enable This field ENABLEs or DISABLEs the ANSI T1.403 Performance Report Message functions.

Zero Suppression

Determines whether ones density insertion is activated after 15 zeros. To ensure compliance with TR 54016, this field must be enabled. The choices are ENABLE and DISABLE.

Alarm Thresholds

The unit can be programmed to generate an alarm condition based on a specific level of performance degradation. Acceptable alarm thresholds are set for periods of 15 minutes (900 seconds). The error types listed in the following paragraphs can be preset to a value between 0 and 900 seconds. Setting a field to 0 diasbles the alarm on that statistic. To effectively disable alarm reporting, set all fields to 0.

The 15-minute time frame is not based on the TR 54016 or T1.403 interval boundaries, but is a time window based on the accumulated counts over the previous 15 one-minute intervals. In all cases, if the number of actual network errored seconds in the previous 15 minutes reaches the preset threshold for the specified error type, an alarm condition is declared.

Alarm Reset Timer

Sets the length of time after the alarm condition clears before the alarm indication is removed. A value of zero in this field does not allow the alarm to be automatically cleared. The default value is 30 seconds.

ES

Sets the errored seconds threshold. The default value is 45 seconds.

SES

Sets the severely errored seconds threshold. The default value is 5 seconds.

LOSS

Sets the loss of signal seconds threshold. The default value is 5 seconds.

OOFS

Sets the out of frame seconds threshold. The default value is 5 seconds.

UAS

Sets the unavailable seconds threshold. The default is 0 (disabled).

RAS

Sets the remote alarm seconds threshold. The default is 0 (disabled).

AISS

Sets the alarm indication signal seconds threshold. The default is 0 (disabled).

BPVS

Sets the bipolar violation errored seconds threshold. The default is 0 (disabled).

T1 DTE Configuration

The T1 DTE Configuration display (Figure 3-8) allows configuration parameters to be set the for the T1 DTE port (if equipped).

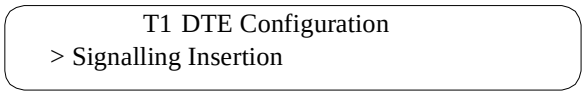


Figure 3-8 T1 DTE Configuration Screen and Diagram

Defaults are shown underlined.

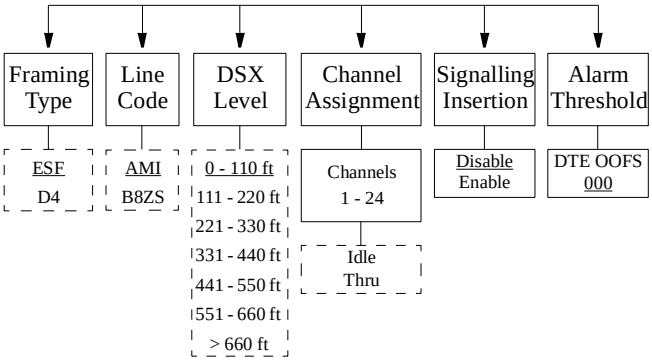


Figure 3-9 T1 DTE Configuration Menu

Framing Type

Selects the type of framing for the T1 DTE side of the unit. The unit permits framing conversion from the DTE to the Network and from the Network to the DTE (D4 to ESF and ESF to D4). Older D4 equipment can be supported with newer ESF spans. Using ESF framing allows access to the increased serviceability and information available through the FDL protocols. The choices are D4 and ESF.

Line Code

Selects the type of line coding for the DTE side of the unit. The choices are AMI and B8ZS.

DSX Level

Specifies the DTE DSX1 interface output level. The choices are 0-110 ft, 111-220 ft, 221-330 ft, 331-440 ft, 441-550 ft, 551-660 ft, and >660 ft.

Channel Assignment

Selects which of the 24 network channels to be passed through to the T1 DTE port. Channels that have been assigned to a high-speed port are indicated and can only be changed through the DTE Port Configuration menu. The default is all channels idle. Choices for the unassigned channels are as follows.

IDLE

Sets the specified channel to transmit idle code on the T1 DTE port and ignore received data.

THRU

Sets the specified channel to pass data from the T1 DTE port to the network and vice versa.

Signalling Insertion

Only channels assigned are displayed. If no channels are assigned, the display reads NO CHANNELS AVAILABLE. The signalling option allows selection of Clear Channel or Robbed Bit signalling for each DS0. Each DS0 is set to the Clear Channel DISABLE mode. This setting should not be changed for raw data channels. However, channels using Robbed Bit signalling must be specified to enable proper handling of the signalling bits. T1-DTE channels must be set to THRU to enable signalling.

Alarm Thresholds

The unit can generate alarm conditions based on alarm thresholds set for periods of 15 minutes (900 seconds). A field set to 0 causes the unit not to alarm on that statistic. To effectively disable alarm reporting, set all fields to 0.

DTE OOFS: Sets the DTE out of frame seconds threshold. The default value is 0 (disabled).

DTE Port Configuration

Defaults are shown underlined.

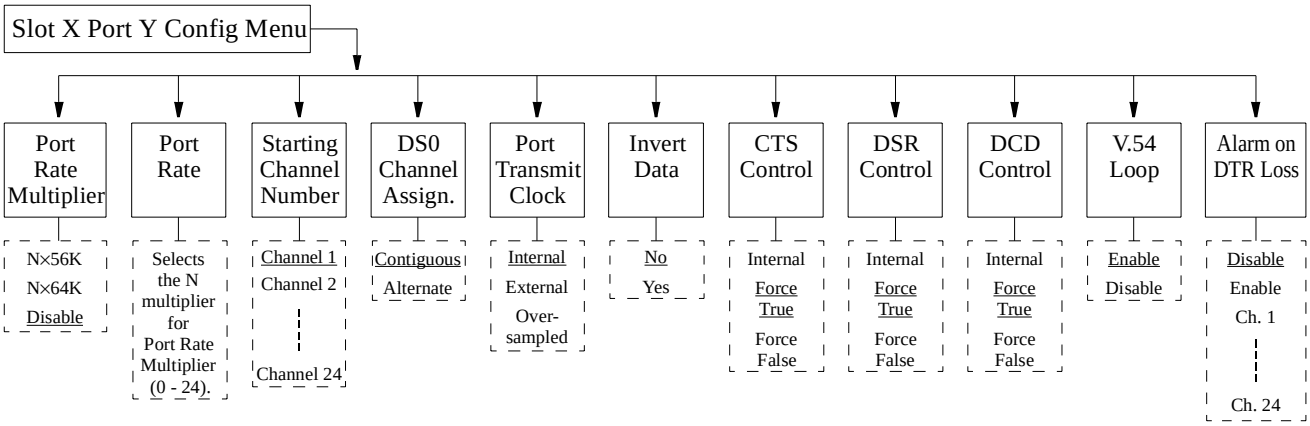


Figure 3-10 DTE Port Configuration Menu

The DTE Port Configuration display (Figure 3-11) sets the operating parameters for each of the high-speed ports. The unit does not allow conflicting configurations for the DTE ports. Therefore, the selections for each menu item are restricted to those that do not conflict with the configuration of other high-speed ports or the T1 DTE Port. The default is all ports disabled.

```
DTE Port Configuration
Port Rate  ... 64K×24=1536 kHz <
```

Figure 3-11 DTE Port Configuration Screen

When channel assignment changes are made to the high-speed ports, the remote communication link, or the T1 DTE, the unit reestablishes the mapping of all channels. This interruption to traffic normally results in a brief burst of data errors on other ports.

Port Rate Multiplier The unit can operate at any data rate that is a multiple of 56 or 64 kbps. If N×64K is selected, the ones density requirements of the T1 network line must be ensured. If N×56K is selected, ones density for the selected DS0 channel is maintained. When set to DISABLE, the port is not used and no other configuration choices for that port are available.

Port Rate The N parameter selects the required port bit rate in increments of 56 or 64 kbps, depending on the selection in Port Rate Multiplier. The N multiplier ranges in value from 1 to 24. For example, if N is 23 and the base rate is 64 kbps, the data rate is 1472 kHz (64 kbps×23).

Starting Channel Number Selects the starting channel in the 24-channel DS1 bit stream. The unit automatically assigns the channels that follow according to the bit rate and the mode selected in DS0 Channel Assignment. If some channels are already allocated, the starting channel is adjusted to the first block of idle channels that matches the bandwidth to be mapped. The starting channel should be checked before bandwidth is allocated.

DS0 Channel Assignment Selects whether the DTE channel assignment is made as a CONTIGUOUS group or as ALTERNATE channels. Selecting ALTERNATE assures ones density.

Port Transmit Clock Used to select the clock that the unit uses to sample the data transmitted from the DTE. When set to INTERNAL, the data is sampled directly with the transmit data clock that is also supplied to the DTE as Transmit Clock. The EXTERNAL option uses the external clock from the DTE. The OVERSAMPLED option is used to operate the port as a low-speed asynchronous port. In this mode, the port rate should be set to at least three times the asynchronous data rate (depending on the degree of allowable distortion for the particular DTE equipment used).

Invert Data In the invert mode (YES), transmit and receive data are inverted at the port interface. This function can be used to guarantee ones density when the data is composed of SDLC-type protocols. The choices are YES and NO.

CTS/DSR/DCD Control Setting any of these three fields to FORCE TRUE or FORCE FALSE allows the forcing of the port control lead output state. INTERNAL allows for normal operation as shown in Figure 3-12 on page 30.

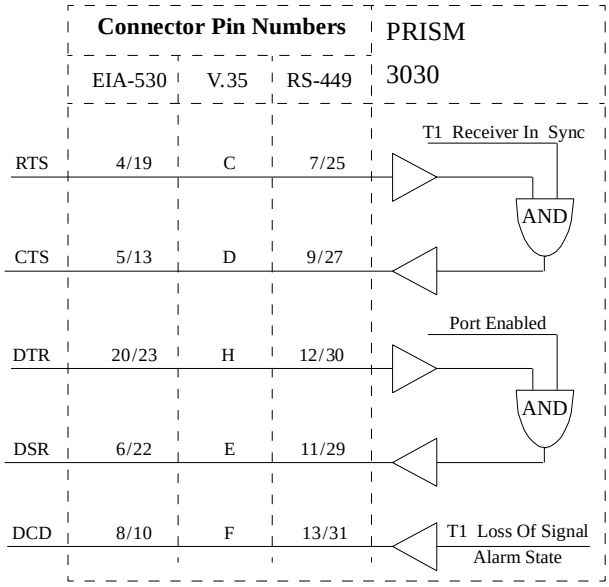


Figure 3-12 High-Speed Data Port

V.54 Loop Selecting Enable allows the unit to respond to in-band V.54 loop commands. If Disable is selected, the unit ignores these commands.

Alarm on DTR Loss Selecting Enable allows the unit to alarm on loss of DTR. The default setting is Disable.

RS-232 Option The RS-232 low-speed port option can be ordered as a combination RS-232/232, RS-232/EIA-530, or RS-232/V.35 application module. The RS-232 port provides a synchronous DCE interface at subrate speeds for connection to customer DTE. The data from the port is placed in a single selected DS0 channel of the T1 network data stream. For switched carrier applications, the RS-232 port provides local RTS to remote DCD control lead operation at all speeds below 64 kbps.

The RS-232 port provides a bidirectional loop for isolating problems associated with the interface. Looping the port does not affect data traffic assigned to any of the other DTE ports. The port loop can be activated from the front panel, the terminal interface, Telnet across the Ethernet or Token Ring interface, or by the reception of in-band V.54 loop code. The unit can also be instructed to transmit the in-band V.54 loop code to loop the corresponding remote end port.

The unit has an internal BERT tester with ten available stress patterns. This capability can be used by looping one end of the DS0 channel assigned to the RS-232 port and BERT toward it from the other end. In addition, the BERT can be activated independently from loops for straight away or point to network testing. RS-232 BERT is valid only at 56 kbps and 64 kbps toward the DTE.

Figure 3-13 on page 31 is an addition to the DTE Port Configuration menu diagram. It shows the modified menu options available for the RS-232 port. The differences are explained in the following paragraphs.

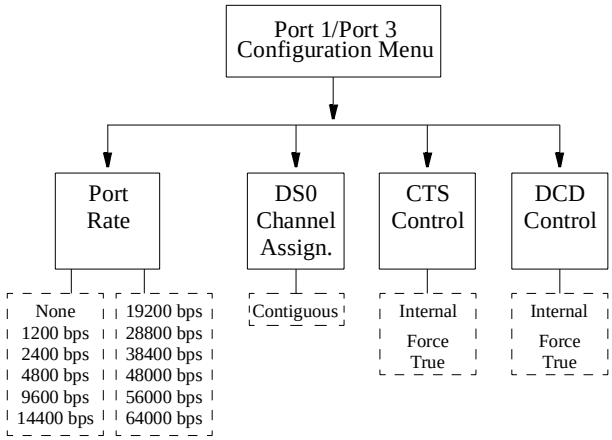


Figure 3-13 RS-232 Modifications to DTE Port Menu

Port Rate Selects the required port bit rate for RS-232 operation. The None option disables all operations for this port.

DS0 Channel Assignment CONTIGUOUS is the only option available for RS-232 operation.

CTS/DSR/DCD Control The control leads on the RS-232 port function as explained in the following paragraphs.

DSR Control

Can be set to Force True, Force False, or Internal. The Internal option has DSR ON if the port is enabled and OFF if it is disabled.

DCD Control

Can be set to Force True or Internal. If set to Internal, DCD is ON when data is being received from the remote end and is OFF when idle code is being received from the far end. Setting to Force True keeps DCD ON regardless of whether data or idle code is being received.

CTS Control

Can be set to Force True or Internal. The setting of CTS Control has an effect on both the CTS control lead presented to the DTE and on the transmit data from the DTE toward the remote end.

If set to Internal the CTS control lead follows the RTS control lead from the DTE after a delay of 21 UI (±1 UI). The data transmitted to the remote end is also determined by the state of the RTS control lead. When RTS is ON, the transmit data from the DTE is sent to the remote end, and when RTS is OFF, idle code is sent to the remote end. If set to Force True the CTS control lead is always ON and the RTS control lead from the DTE is ignored. Thus the transmit data from the DTE is always sent through to the remote end.

Voice Port Configuration

The Voice Port Configuration display (Figure 3-14) allows the assignment of voice DS0s to network channels. Only the voice ports with the Mode parameter set to Active are connected to the selected network channel. Each voice port module has 6 voice circuits, each of which is independently assignable to a selected network channel. For a detailed description of voice port operation, refer to Appendix B.

Defaults are shown underlined.

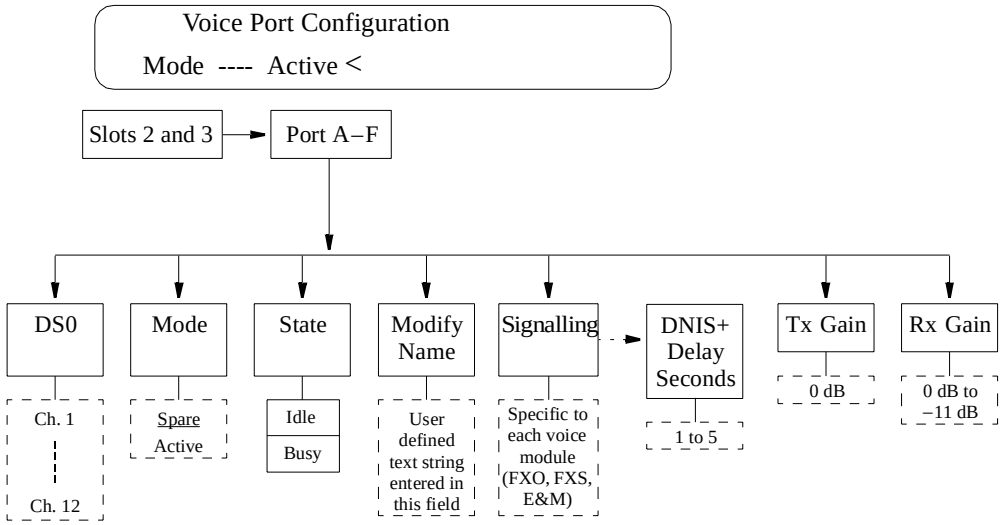


Figure 3-14 Voice Port Configuration Screen and Menu

DS0 Assigns the voice port to a network channel. The choices are Ch. 1 through Ch. 12.

Mode Selects whether the voice port is actively assigned to a network channel (Active) or is not used. When set to Spare, the other voice port parameters are ignored and the port is inactive. The port must be set to the Spare mode before it can be assigned to another channel. On E&M application modules, select Active4w, Active2w, or Spare.

State Displays the voice port status as either in the Busy or Idle state.

Modify Name Can be used to provide up to 20 characters of text for identifying the voice circuit name and number. Use the same procedures described for passwords.

Signalling Selects the supervisory operation of the voice port. The choices are as follows.

FXS

FXS/LS:	Foreign Exchange Station/Loop Start
FXS/GS:	Foreign Exchange Station/Ground Start
UVG:	Universal Voice Grade
MEG/LS:	MEGACOM/Loop Start

MEG/GS:	MEGACOM/Ground Start
MEGR/LS:	MEGACOM/Loop Start with Reverse Battery
MEGR/GS:	MEGACOM/Ground Start with Reverse Battery
PLAR:	Private Line Automatic Ringdown
SLC 96:	SLC 96 Channel Signalling
DID/DNIS:	Direct Inward Dialing/Dialed Number Identification Service [Dial Pulse Originate (DPO) mode]
DNISW/LS:	Loop Start DNIS (LS-DNIS) with wink
DNISD/LS:	LS-DNIS with delay start
DNISWR/LS:	LS-DNIS with wink and Reverse Battery
DNISDR/LS:	LS-DNIS with delay and Reverse Battery
DNISW/GS:	Ground Start DNIS (GS-DNIS) with wink
DNISD/GS:	GS-DNIS with delay start
DNISWR/GS:	GS-DNIS with wink and Reverse Battery
DNISDR/GS:	GS-DNIS with delay and Reverse Battery

FXO

FXO/LS:	Foreign Exchange Office/Loop Start
FXO/GS:	Foreign Exchange Office/Ground Start
FXO UVG:	Foreign Exchange Office/Universal Voice Grade
FXO UVGR:	Foreign Exchange Office/Universal Voice Grade with Reverse Battery
DID/DNIS:	Direct Inward Dialing/Dialed Number Identification Service [Dial Pulse Terminate (DPT) mode]

4-Wire E&M

		F-3010-200--112	*F-3010-200--114*
Type I:	Signalling	Yes	Yes
Type II:	Signalling	Yes	Yes
Type III:	Signalling	Yes	Yes
Type IV:	Signalling	No	Yes
Type V:	Signalling	No	Yes
TO:	Transmission Only	Yes	Yes

DNIS+ Delay Seconds If signalling mode has a delay, it can be set from 1 to 5 seconds.

Tx Gain Selects the transmit gain over the following ranges:

2-Wire FXS: –4.0 dB fixed

2-Wire FXO: –6 dB to 0 dB

4-Wire E&M: –14 dB to +2 dB

Rx Gain Selects the receive gain over the following ranges:

2-Wire FXS: –11 dB to 0 dB

2-Wire FXO: –6 dB to 0 dB

4-Wire E&M: –18 dB to –1 dB

SNMP Configuration

The SNMP (Simple Network Management Protocol) interface application module is an option for the unit. It provides seamless integration and control of CSU/DSU functions within an existing SNMP-managed LAN/WAN environment (see Figure 3-15).

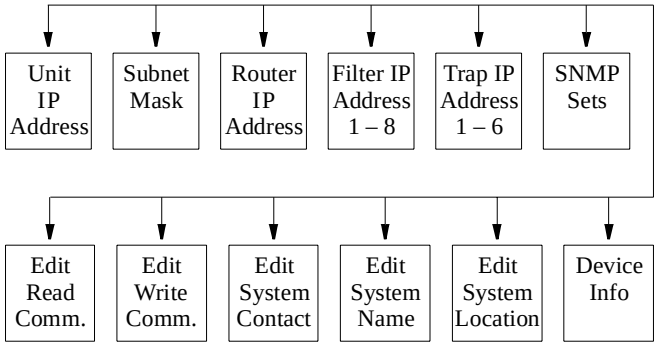


Figure 3-15 SNMP Menu Diagram

SNMP management stations are able to collect and analyze data from all network devices that comply with the SNMP protocol and to manage those devices. SNMP provides a standard means to monitor the status of all compatible network elements.

The SNMP Configuration screens are accessible if the unit is equipped with the Ethernet or Token Ring SNMP interface option. It allows for the entry of those parameters required for proper operation of the unit with an Ethernet- or Token Ring-based LAN manager.

The SNMP menu consists of alphanumeric entry only (no selectable parameters). The following three menu items use the format shown in the IP Address screen. Each number has a range from 0 to 255 and is separated by a period.

```
SNMP Configuration
Unit IP Addrs.....132.016.232.000<
```

Figure 3-16 IP Address Screen

Unit IP Address Accepts IP addresses. Each device connected to the LAN is required to have a unique IP address identifier.

Subnet Mask Provided to manually override the subnet mask setting which is otherwise discovered by the SNMP agent.

Router IP Address Accepts the IP address of a default router, if one is present.

Filter IP Address These eight fields accept the IP address of the source packet filter. If any of these fields are set, access is allowed only by the specified IP addresses.

Trap IP Address Accepts the IP address of a network device where alarm reporting traps are to be sent. The unit detects and reports T1 network alarms and provides several options for reporting them, one of which is SNMP traps. When a network alarm occurs, the unit sends a trap message to up to six destinations on the customer's network.

SNMP Set Enables or disables the set command responses. Refer to Appendix C for detailed information on these responses.

The following five menu items use the format shown in the System Edit screen. The top line in each screen accepts a string of up to 255 characters that identifies the appropriate group, person, device function, or unit location. Each character is entered using the up or down arrow keys until the desired character is displayed. The right arrow moves the cursor to the next position. Continue this pattern until the last character has been selected and press Select.

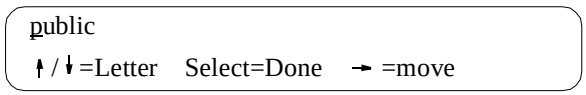


Figure 3-17 System Edit Screen

Read Community Accepts a character string identifying the group authorized to perform read operations. The default setting is public.

Write Community Accepts a character string identifying the group authorized to perform write operations. The default setting is private.

System Contact Accepts a character string identifying the person responsible for a network device. The default setting is no system contact.

System Name Accepts a character string identifying the functionality of the network device. The default setting is no system name.

System Location Accepts a character string identifying the physical location of network device. The default setting is no system location.

Device Info Displays the Ethernet or Token Ring hardware/software revision level.

Diagnostics

The Diagnostics screen (Figure 3-19) allows test and maintenance functions to be performed on the T1 network, the T1 DTE port, and the high-speed ports. The unit recognizes in-band and FDL out-of-band loopback requests. The unit also recognizes local testing and remote network management loopback test configurations. The unit supports many ways to test the service to and from the unit (see Figure 3-18).

Defaults are shown underlined.

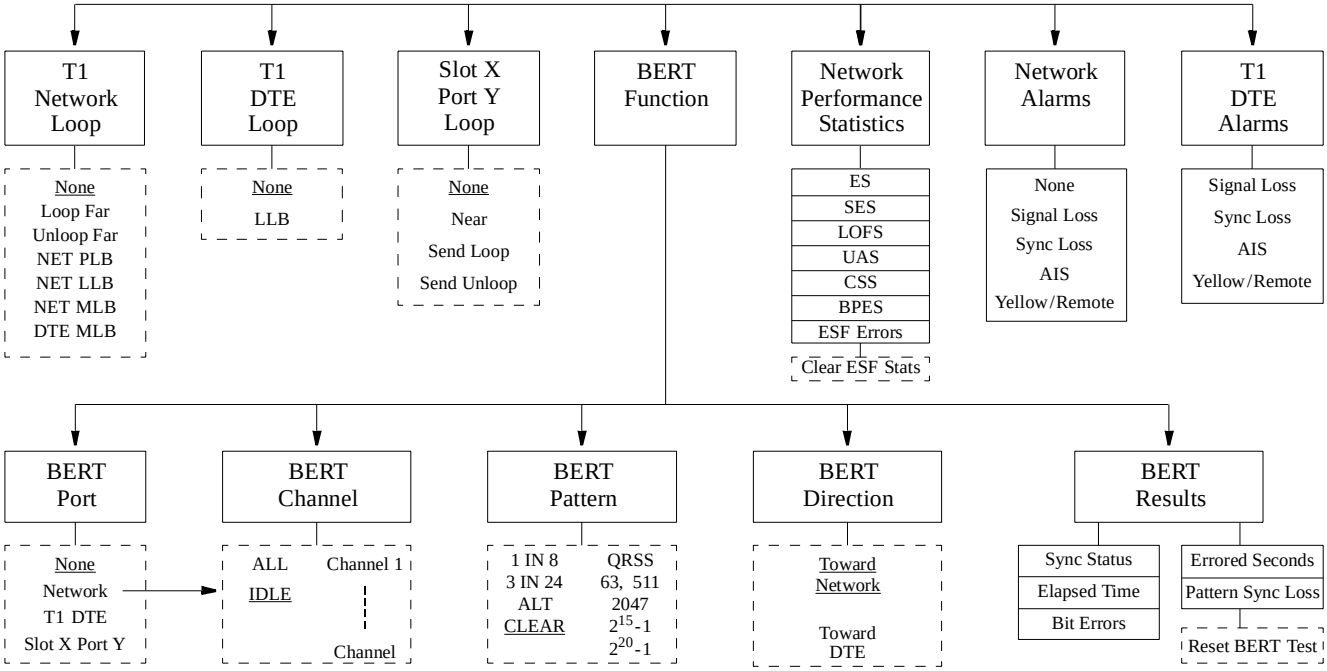


Figure 3-18 Diagnostics Menu

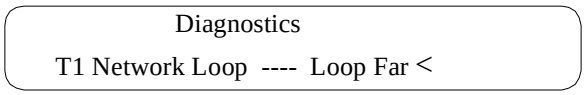
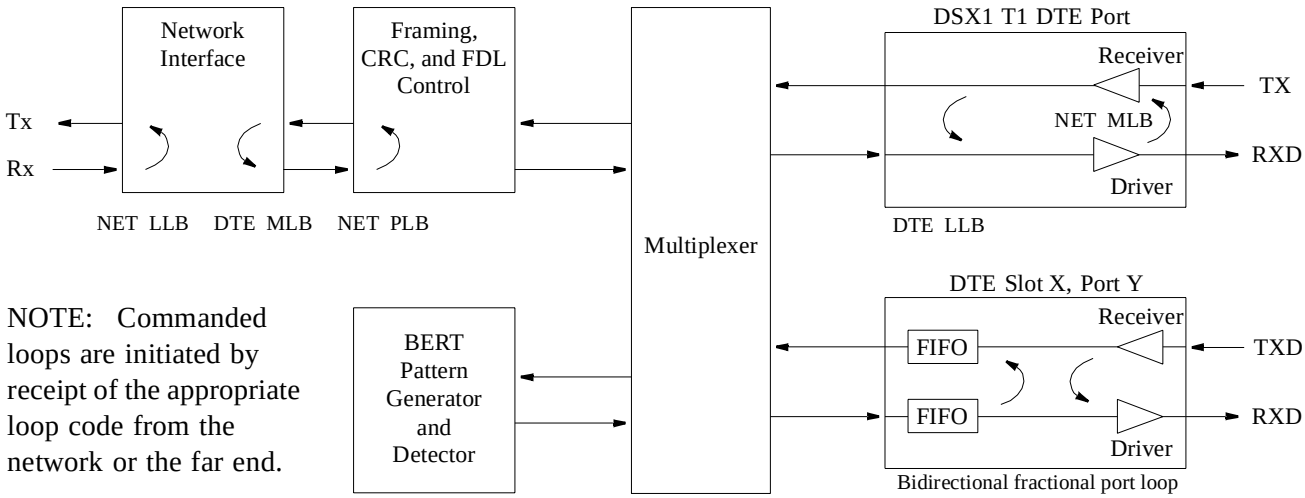


Figure 3-19 Diagnostics Screen

The unit monitors network loopback commands and activates loops based upon their reception as described in TR 54016 and T1.403. Refer to Figure 3-20 for a depiction of the loop modes (See also Figure 4-7 and Figure 4-8 on page 59). The Diagnostics menu allows for loopback and BERT functions as explained in the following paragraphs.



NOTE: Commanded loops are initiated by receipt of the appropriate loop code from the network or the far end.

Figure 3-20 Diagnostics Loop Functions

T1 Network Loop

The looping choices are as follows (note that far loops are not allowed during BERT).

NONE

Network loop not present.

LOOP FAR

Sends loop codes over the network to the far end unit to force it into a NET LLB.

UNLOOP FAR

Sends unloop codes to the far end unit to remove the loop condition.

NET PLB

The payload loopback selection loops the data back toward the network. Framing, CRC, and FDL are regenerated and all ones are passed to the DTE ports.

NET LLB

The local loopback selection loops data received from the network back toward the network. Received data is also passed through to the DTE ports as normal.

NET MLB

Network maintenance loopback loops data at the T1 DTE port back toward the network (passes network data to DTE and return data to network). This affects only network channels assigned to the T1 DTE.

DTE MLB

The T1 DTE maintenance loopback loops network data back toward the DTE at the network interface. Data is also passed through to the network.

T1 DTE Loop

The looping choices are as follows.

NONE

DTE loop not present.

LLB

The local loopback selection loops data received at the T1 DTE interface back toward the T1 DTE. Data is also passed through to the network.

Slot X Port Y Loop

Ports are indicated as Slot X/Port Y, where X = 2 or 3 and Y = A or B. The looping choices for each port are as follows:

NONE

Port loop not present.

NEAR

A bidirectional fractional loop is set at the port interface.

SEND LOOP

A V.54 in-band loop code is transmitted to the far-end unit to force it into a NEAR loop mode on the selected port.

SEND UNLOOP

Unloops the far-end unit.

BERT Functions

The following menus offer selections for the BERT port, direction, and pattern along with test results.

BERT Port

Selects the port to be tested. The NONE setting disables the BERT generator. The NETWORK option tests all channels selected. The T1 DTE option tests all channels associated with the T1 DTE port. Selecting a single port tests all the channels associated with that port.

BERT Channel

Available only when BERT Port is set to Network. This allows selection of a specific DS0 channel (1 to 24) to be tested. Only unassigned (idle) channels appear as selections. If ALL is selected, the entire T1 bandwidth is tested. If IDLE is selected, all unassigned channels are tested.

BERT Pattern

Specifies which pattern is transmitted toward the port being tested. The choices are 1 IN 8, 3 IN 24, ALT, CLEAR, QRSS, 63, 511, 2047, 2^{15}–1, 2^{20}–1, and 2^{23}–1.

BERT Direction

Selects which direction to send the test pattern. The choices are Toward Network or Toward DTE. If the BERT Port menu is set to Network, the BERT direction is automatically forced toward the network and this option does not appear.

BERT Results

The following BERT status and error counts are available through this selection:

Sync Status. Displays the state of pattern sync during a test. If no test is in progress, NO SYNC is displayed.

Elapsed Time. Displays the elapsed time since a timed test began. A value is displayed only when a test is running (in the HH:MM:SS format).

Bit Errors. Displays the total number of bit errors detected since the test began or since error statistics were last cleared.

Errored Seconds. Displays the number of errored seconds that have been detected since the test began or since error statistics were last cleared.

Pattern Sync Losses. Displays the number of times during the test period that the BERT pattern detector lost sync.

Reset BERT Test. When set to YES, the BERT error counts and elapsed time values are cleared to zero. This parameter then returns to NO automatically.

Network Performance Stats

The unit records performance statistics as described in TR 54016. The unit is equipped with a dual set of data registers with individual resets that maintain these statistics. One set is accessed by the network service provider (telco). The other set is accessed through the front panel, terminal interface, or the Verilink 8100A Site Controller.

Performance data is collected in 15-minute intervals for the preceding 24-hour period. The intervals (numbered Int# 00 to Int# 96) are viewed by pressing Select and using the up and down arrow keys. Interval 00 is the most recently stored interval and interval 96 is the interval that is 24 hours old. Pressing the Exit or Select keys returns the cursor to the left. This allows scrolling to another data type.

When a specific interval is selected for viewing performance data, all other parameters reflect that interval until another interval is selected.

Errored Seconds

ES displays the number of one-second intervals where at least one CRC or out-of-frame error event occurred.

Severely Errored Secs

SES displays the number of one-second intervals where at least 320 CRC errors were detected or at least one out-of-frame event occurred.

Loss of Frame Secs

LOFS displays the number of seconds that the network interface is out of frame sync.

Unavailable Seconds

UAS displays the number of one-second intervals of unavailable service. Counting begins when 10 consecutive severely errored seconds (CSES) occur and ends when 10 consecutive seconds pass with no SES. The initial 10 seconds are included in this count.

Controlled Slip Seconds

CSS displays the number of one-second intervals where at least one controlled slip occurred.

Bipolar Error Secs

BPES displays the number of one-second intervals where at least one bipolar code violation occurred.

Daily performance data for the parameters listed above appears following the 15-minute interval listings. It is collected in 24-hour intervals for the preceding 30-day period. The days (from Day#00 to Day#30) are viewed by pressing Select and using the up and down arrow keys. Day#00 is the most recently stored day and Day#30 is the oldest day. Pressing the Exit or Select keys returns the cursor to the left.

ESF Errors

Displays the total number of ESF error events since the counts were last reset. This value is not recorded by interval. Counting stops when the value of 65535 is reached.

Clear ESF Stats

When YES is selected, all user network performance registers are set to zero and the parameter returns to NO. The telco register set (accessible by the service provider) is not cleared by this action.

Network Alarms

The network interface alarm status is reported as one of the states shown in the following paragraphs. The front panel alarm indicator and the rear panel alarm relay contacts are controlled solely by the user-selected Alarm Thresholds on page 26.

SIGNAL LOSS

Indicates that the T1 receive signal level has dropped below the level that can be detected.

SYNC LOSS

Indicates that the unit is unable to synchronize on the incoming T1 framing pattern.

AIS

Indicates that an unframed all ones pattern is being received.

YELLOW/REMOTE

Indicates that a remote (yellow) alarm indication is being received.

T1 DTE Alarms

T1 DTE alarm status is reported using the same parameters as defined for Network Alarms in the preceding paragraphs. The front panel alarm indicator and the rear panel alarm relay contacts are a function of the network alarm thresholds, not the T1 DTE interface.

System Utilities

The System Utilities display (Figure 3-22) allows performing the various functions shown in Figure 3-21 and described in the following paragraphs.

Defaults are shown underlined.

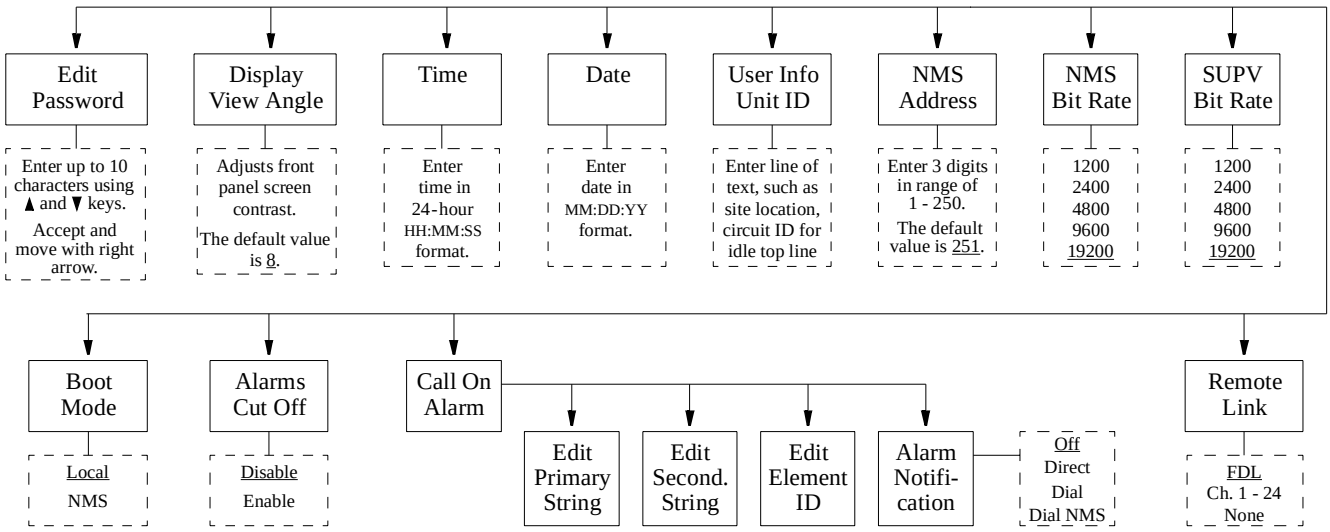


Figure 3-21 System Utilities Menu Diagram

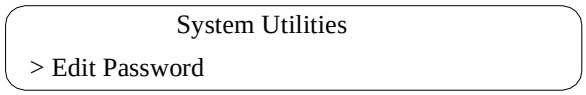


Figure 3-22 System Utilities Screen

Edit Password

The unit is factory shipped with the password disabled (factory default). A password is selected by entering up to 10 alphanumeric characters. Each character is entered using the up or down arrow keys until the desired character is displayed. The right arrow moves the cursor to the next position. Continue this pattern until the last character is selected and then press Select. The password function is disabled by selecting this field and pressing Select without selecting any characters.

The password is case sensitive. During log on, it must be entered exactly as it was programmed.

Display View Angle

The contrast of the front panel LCD display has a different appearance depending on whether it is being viewed from a high angle or a low angle. Use the arrow keys to adjust for the most suitable contrast. There are 18 selectable values, with a default value of 8.

Time

Set the time by entering each digit in the standard 24-hour HH:MM:SS format. Each field is range checked and automatically limited to the appropriate range of values.

Date

Set the date by entering each digit in the standard MM/DD/YY date format. Each field is range checked and automatically limited to the appropriate range of values.

User Info/Unit ID

The idle screen top line can be changed in this field. Text is entered using the up and down arrow keys to scroll through each character and the right arrow key to change cursor position. The original text can be restored by pressing Exit at any time during the editing process. The screen is shown in Figure 3-23.

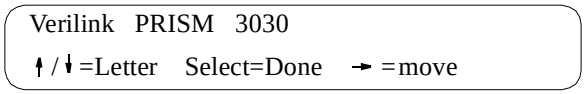


Figure 3-23 User Info/Unit ID Display Screen

NMS Address

When used with the Verilink 8100A Site Controller, each unit connected to the local daisy chain must be programmed with a unique address in the range of 1 through 25. To program a number, scroll through the digits with the up and down arrow key. Press the right arrow key to select a digit. A valid NMS address must be selected before the configuration can be recalled upon start up.

After software has been downloaded into the flash memory, the RAM must be cleared. This process sets the NMS address to 251.

NMS Bit Rate

Sets the interface speed for the NMS IN and NMS OUT ports. The selections are 1200, 2400, 4800, 9600, and 19200 bps.

Supv Bit Rate

Sets the interface speed for the supervisory port (SUPV). The selections are 1200, 2400, 4800, 9600, and 19200 bps.

Boot Mode

When the unit is powered, configuration is based on this selection. If set to LOCAL, the unit restores the configuration parameters in effect when power was lost. If set to NMS, the unit uses the configuration parameters supplied from the 8100A database (the unit must have a valid NMS address: from 1 to 250). As shipped from the factory, the unit uses the factory default configurations stored in the LOCAL memory.

Alarm Cutoff

When this menu item is set to DISABLE, the unit reports a network interface alarm condition by lighting the front panel indicator and activating the alarm relay contacts on the rear panel. When set to ENABLE, the front panel ALARM indicator does not light during an alarm condition and the alarm contacts are forced to an inactive state regardless of the alarm status.

Call on Alarm

Controls remote alarm reporting. Three submenus are available as follows.

Alarm Notification

OFF. Disables alarm reporting.

DIRECT. Sends reports to a printer or terminal connected directly to the supervisory port.

DIAL. Sends reports through an attached AT command set compatible modem connected to the SUPV serial port, which must dial out to a remote modem.

DIAL NMS. Calls the 8100A to dump alarms directly.

Edit Primary and Secondary Dial String

These fields are 18-character ASCII strings for the call on alarm phone numbers used in the DIAL and DIAL NMS modes. The unit attempts three times to connect using the primary number. If all three attempts fail, it attempts three times to connect using the secondary number (if it is not blank). If the secondary number fails, the unit waits five minutes and then attempts to communicate with the primary number again. When a connection is detected, the unit outputs the notification message (as described in Edit Element ID below) and then disconnects.

Edit Element ID

Allows entering a 29-character ASCII string which identifies the unit to the device receiving the alarm notification messages.

Remote Link

The unit utilizes a remote link to communicate with remote units. The facility data link (FDL) can be used in cases where the T1 path is not routed through equipment that blocks the FDL. If the network framing mode is set to D4 or the FDL is not available, a spare channel can be assigned. Possible channel selections are those that have not been assigned for use with a high-speed port or passed through to the T1 DTE. The choices are FDL, None, and channels 1 through 24.

Log Off

If the unit is not programmed with a password, the user can leave the menu system by pressing Exit from the Main Menu. If a password has been programmed, the unit prevents an inadvertent log off by requiring the user to press Select in the Log Off menu. Once logged into the front panel, the interface remains active until the user logs out.

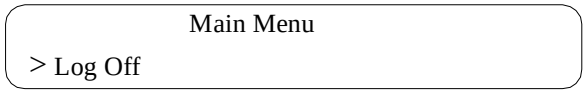


Figure 3-24 Log Off Screen

4 TERMINAL OPERATION

Introduction

This chapter describes the screens and menus of the Verilink PRISM 3030 terminal interface, an application program embedded in the unit. The Operations chapter discussed the screens and menus associated with the front panel interface. Although the options are essentially the same for both interfaces, the terminal interface shows more parameters on each screen.

System Description

The Terminal Interface requires an ANSI-compatible VT100 terminal (ASCII), or a computer running an ANSI terminal emulation program. The terminal interface utilizes ASCII break and escape functions, which are implemented differently with the various terminal emulation programs. The documentation supplied with the terminal emulation program should be consulted for further reference.

In addition to the TR 54016 and T1.403 protocols, proprietary messages can be sent over the facility data link (FDL) from the near-end unit to the far-end unit. A local RS-232 terminal connected to the unit can access a far-end unit. Thus, the remote unit can be queried for status and statistics, configured, or looped for testing as if the terminal is connected to it directly.

Interface Connection

The terminal can be connected to either of two 6-pin serial RS-232 ports on the unit. One of the modular ports is a pair of daisy-chain type rear panel connectors labeled NMS IN. The other port is labeled SUPV. Refer to Supervisory Port Connection on page 16 for further information. Cables are available for most typical connections. Standard cables and ordering numbers are listed in Ordering Numbers on page 121. Contact Verilink for any assistance in cable selection.

A serial bit rate of 1200, 2400, 9600, or 19200 bps can be selected using the front control panel (see Supv Bit Rate on page 42).

Both serial ports support the same custom protocols which allow the terminal interface or the Verilink 8100A Site Controller to request and receive performance and configuration data from the unit. The unit automatically determines which protocol is needed.

Modem Compatibility

The terminal interface supports use of an AT command set compatible modem on either, or both, of the NMS IN and SUPV serial ports. The modem should be optioned to ignore DTR, enable auto answer, inhibit command echo, and return verbose result codes.

If the unit is called and sent the break command before receiving the connect message, the modem hangs up.

Screen Components

Terminal interface screens have several components common to all screens and is discussed individually in the following paragraphs. These common elements are shown in the Password Screen (Figure 4-1).

```
3030 DSU x.xx/x.xx                  PRISM 3030                    Date: MM/DD/YY
No Far End Response              (Unit Address: 23)               Time: HH:MM:SS

------------------------------ PASSWORD SCREEN -------------------------------


                        Enter Password:    (**********)



                              Start Date:   MM/DD/YY
                              Start Time:   HH:MM:SS









-----------------------------------Messages-------------------------------------
                                                                     Local Screen
```

Figure 4-1 Password Screen

Device Type and Revision

The device type (the PRISM 3030) and the revision control numbers are shown in the upper left corner. The first number is the hardware revision and the second number is the software revision. Information is displayed for the near-end unit (connected directly to the terminal) on the top line, and for the far-end unit (connected to the network T1 interface) on the second line. Refer to this information when contacting the factory with inquiries.

The far-end information is available only for Verilink products that support a proprietary message set. If the far end does not support these messages but does support the standard TR 54016 protocol, then the far-end information is displayed as GENERIC 54016 FAR END. If the far end does not respond to either proprietary or TR 54016 messages, then NO FAR END RESPONSE is displayed. If the far end echoes the FDL messages transmitted by the near-end unit, then FAR END LINE LOOP is displayed.

Date/Time

The top right corner of the terminal screen displays the date and time. Setting these functions is described in Set Date on page 74 and Set Time on page 74.

Element ID: Unit Address

Below the header (PRISM 3030), the Element ID is displayed (see Element ID on page 75). Next to the Element ID is the unit's NMS address (see NMS Address on page 42).

Menu Title

The menu title (third line, center) denotes the general classification of user-accessible functions (such as Alarms or Performance).

Messages

This line displays diagnostic messages.

Interface Start-Up

Once a compatible terminal is properly connected to the unit, a terminal interface session is started by sending a break command or pressing Enter four times to the unit. If the NMS port is used, the unit then responds with the prompt Enter Unit Address. To activate the first (or only) unit, simply press Enter. To select a specific unit, enter the address number of the desired unit and press Enter.

The Enter Unit Address prompt times out after 10 seconds. If this happens, send another break. To select another unit, exit the current Terminal Interface session, send a break, and repeat the process. If an invalid address is entered, that address is echoed back to the terminal. Send another break to start a new session.

The Main Menu screen (Figure 4-2) is then displayed if no password has been specified. The Utilities menu (page 74) explains setting the password. In the Password screen (page 46), the correct password must be entered to obtain access to any other menu.

The password is case-sensitive.

```
3030 DSU x.xx/x.xx                  PRISM 3030                  Date: MM/DD/YY
3030 DSU x.xx/x.xx              (Unit Address: 23)              Time: HH:MM:SS

------------------------------------ MAIN -------------------------------------

                                  Element: [    ]




                                Alarms
                                Performance
                                Maintenance
                                Configuration
                                DDS Status
                                Utilities









-----------------------------------Messages-----------------------------------
                                                                    Local Screen
```

Figure 4-2 Main Menu Screen

Cursor Controls

The terminal interface utilizes a highlighted cursor to make selections from menus and select fields within screens to be operated on. The cursor is moved in different ways, depending on the terminal emulation program used. Most programs allow use of the tab and shift+tab keys. Others allow use of the four arrow keys. Once a field is highlighted, it is manipulated as described in Field Types.

For keyboards that do not have these standard keys or have only some of them, an alternate set of cursor control commands is provided. Each command is performed by pressing a letter key while holding down the Control key. Alternate commands can be freely mixed with the keyboard commands at the user's discretion.

Table 4-1 Keyboard/Alternate Commands

Keyboard Command	Alternate Command
Left arrow	Control+S
Right arrow	Control+D
Up arrow	Control+E
Down arrow	Control+X
Backspace	Control+H
Delete	Control+Z

Field Types

Each screen is made up of fields. The two basic field types are user-selectable and display only. If the highlighted cursor can be moved to a field, it is a user-selectable field. All other fields are for display only. User-selectable fields allow for changes to be made or commands to be executed.

Fields without brackets or parenthesis are display only. They cannot be changed on the screen. Most user-selectable fields are enclosed in brackets or parenthesis and are described in the following paragraphs.

Fields enclosed in brackets [ ] offer a list of selections. The selections are made by pressing the spacebar. Each time it is pressed, a new item appears. When the appropriate choice is displayed, press Enter to select it.

Manipulate fields enclosed in parenthesis ( ) by either of the following methods:

- Pressing Enter on such fields as (Reset) and (Start Test) simply executes the function.
- The most common type of field in parenthesis accepts alphanumeric characters. Typing characters when the field is highlighted causes new characters to replace the present entry. To edit an existing entry rather than replace it, press the right arrow key to move the cursor to the point that needs editing. Characters can then be inserted or deleted. Typed data is always inserted rather than typed over. If the field is full, though, at least one character must be deleted to add another.

  Many fields of this type can also be toggled by pressing the spacebar. Other fields are range checked, where exiting the program with an illegal value set is not allowed.

Any screen can be redisplayed (or refreshed) by pressing Control+U. Any changes to fields on a screen, that have not been activated by pressing Enter, are discarded.

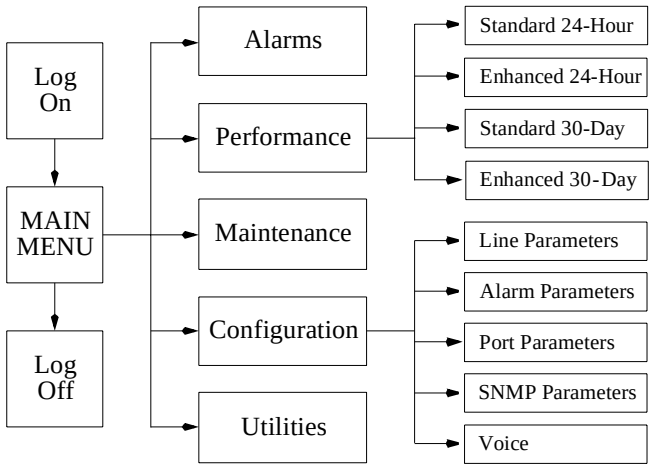


Figure 4-3 Menu Structure

Main Menu Screen

The Main Menu screen (Figure 4-2) lists the functional user-accessible menus. To activate any menu, highlight the desired selection and press Enter. This menu and any subsequent menu can be exited by pressing Escape. If the Main Menu is exited, the terminal interface program terminates. This is a valid way to end a session. If any other menu is exited, the previous screen is returned.

The menu structure (Figure 4-3) shows all the screens accessible from the Main Menu.

If no key is pressed for 10 minutes, the terminal interface logs off automatically. To manually log off, press Escape from the Main Menu.

Alarms Screen

The Alarms screen (Figure 4-4) is used to view the alarm status of the network and the DTE lines. The fields are described as follows.

NET/DTE Alarms

These status lines display the selected element's network/DTE signal alarm state. Alarms are determined by the user-selectable thresholds listed in Table 4-2.

Table 4-2 Alarm Indications

Alarm	Description
-------	No status is available.
OK	No alarm threshold has been exceeded, although errors might exist that do not exceed thresholds.
ERRS	The Errored Seconds, Severely Errored Seconds, or Bipolar Errored Seconds threshold is exceeded.
LOSS	The Loss Of Signal Seconds threshold is exceeded.
OOFS	The Out Of Frame Seconds threshold is exceeded.
RAIS	The Remote Alarm Seconds threshold is exceeded.
AISS	The Alarm Indication Seconds threshold is exceeded.
UAS	The Unavailable Seconds threshold is exceeded.

(Alarm status)

The main body of the Alarms screen shows the count for parameters that can be used to trigger an alarm.

The Current column shows the total of the preceding 15 one-minute intervals. At the end of each one-minute interval, the oldest minute of the 15-minute interval is discarded.

```
3030 DSU x.xx/x.xx                  PRISM 3030                    Date: MM/DD/YY
3030 DSU x.xx/x.xx              (Unit Address: 23)                Time: HH:MM:SS

------------------------------------ ALARMS ----------------------------------

                                  Element: [    ]

           NET Alarms: OK
           DTE Alarms: OK
                                              Current             Threshold
           Loss of Signal Seconds (LOSS)           0                     5
           Errored Seconds (ES)                    2                    45
           Severely Errored Seconds (SES)          2                     5
           Unavailable Seconds (UAS)               0                     0
           Out of Frame Seconds (OOFS)             0                     5
           Remote Alarm Seconds (RAS)              0                     0
           AIS Seconds (AISS)                      0                     0
           BPV Seconds (BPVS)                      0                     0
           DTE LOS/OOF Seconds (LOSS)              0                     0
           Power Loss Seconds (PLS)                0

           Reset Alarm Registers:             (RESET)
-----------------------------------Messages-----------------------------------
                                                                  Local Screen
```

Figure 4-4 Alarms Screen

The Threshold column shows the values set in the Alarm Configuration screen (Alarm Configuration Screen on page 64). Any parameter that has a value equal to or greater than its non-zero threshold generates an alarm. Any parameter with a threshold value of 0 is disabled from generating alarms.

The parameters shown on the Alarms Screen are updated at five-second intervals.

Power Loss Seconds Displays the number of seconds that the element has been without power since this value was last cleared.

Reset Alarm Registers Pressing Enter on (RESET) zeros the value of all Current alarm parameters, but does not affect 24-hour or 30-day performance registers.

Performance Screens

The Performance screens display a detailed history of the error parameters that are continuously monitored. The terminal interface provides display of near-end or far-end performance data using the facility data link.

The unit is equipped with a dual set of performance data registers that hold line statistics for both the telco and user. Each register set provides detailed status and performance history for the network and DTE interfaces.

The system has four Performance screens. The STANDARD 24 HOUR and the ENHANCED 24 HOUR screens allow viewing the 24-hour detailed performance history of the T1 circuit. The only difference in the two screens is in the type of performance data displayed. The STANDARD 24 HOUR screen is shown in Figure 4-5.

```
3030 DSU x.xx/x.xx                PRISM 3030                    Date: MM/DD/YY
No Far End Response           (Unit Address: 23)                 Time: HH:MM:SS

------------------------------ 24 HOUR PERFORMANCE ------------------------------

     Element: [NEAR]                        Status: OK
     Target: [USER ][NET]                   Completed Days:        12
     Error Events:   302   (RESET)          Completed Intervals:    6
     (RESET PERFORMANCE REGS)               24 Hr.% Error Free:   91.7

                              [STANDARD 24 HOUR]

         362                  2     362       0       2       3       3
         24 Hour              6    2700       0       2       3       0
         30 Day              30       0      20      12      23      13
PAGE-UP ---------------------------------------------------------------------------
          Time    INTERVAL    ES     UAS     BES     SES    LOFC     CSS
PAGE-DN ---------------------------------------------------------------------------
         13:30       6         1     900      0       0        1       0
         13:15       7         2     900      0       0        3       3
```

Figure 4-5 Typical Performance Screen

The STANDARD 30 DAY and the ENHANCED 30 DAY screens allow viewing a 30-day history of a particular element's performance. These screens reference intervals by date rather than by time. To reach each of the four screen types, use the spacebar to toggle the STANDARD 24 HOUR field. The other fields are described as follows.

Element

Pressing the spacebar toggles this field for selection of either the NEAR or FAR unit as the source of performance data or the target of commands. NEAR refers to the unit the terminal is connected. FAR refers to the unit at the other end of the network T1 span.

Target

This two-part field determines which section of the circuit is presently displayed by toggling the spacebar. Telco registers are for viewing only and can not be changed. The four options are described as follows.

USER NET. Display the user performance registers for the network.

USER DTE. Display the user performance registers for the T1 DTE.

TELCO NET. Display the telco performance registers for the network.

TELCO DTE. Display the telco performance registers for the T1 DTE.

Error Events

Displays the running total of ESF error events for the circuit selected in Element and is applicable only when Target is set to USER. This count accumulates until it reaches 65535 or is reset by pressing Enter with the (RESET) field highlighted.

Reset Performance Registers

Allows the element registers to be reset and can only be used when the Target field is set to USER. If Enter is pressed, the following warning appears:

```
DELETE ALL PERFORMANCE DATA?
(NO!)  (YES)
```

To exit this screen without performing the reset function, press Enter with NO selected. To proceed with the reset function, press Enter on YES. All values for the chosen register set (NET or DTE) are then reset to zero.

Standard 24 Hour

Toggling this field with the spacebar steps through the four available performance screens.

The remainder of the fields in the Performance screen are for display only. They are defined as follows.

Status

Displays the selected T1 line status derived from the type (or absence) of errors in the received data. This status represents the immediate state of the received T1 signal and is not related to the alarm thresholds. This field shows one or more of the signal conditions listed in Table 4-3.

Completed Days

Displays the number of days included in the 30-day totals.

Completed Intervals

Displays the number of 15-minute intervals in the last 24-hour period since the registers were last cleared (a 24-hour period can contain up to 96 intervals).

24 Hr.% Error Free

Displays the percentage of error-free seconds within the last 24 hours or since the event registers were last cleared. It is based only on the ES and UAS parameters.

(Performance data)

The main body of display data consists of error events for three different periods: The first display line shows the data accumulated for the current interval (from 0 to 900 seconds). The second line shows the totals for the last 24-hour period (or the last 96 fifteen-minute intervals). The third line shows the 30-day totals.

The remaining lines of this screen show the data for any intervals containing errors. Interval 1 is the most recently stored 15-minute interval and interval 96 is the oldest in the current 24-hour period. On the 30-day screens, interval 30 is the oldest 1-day interval in the current 30-day period. The real time (or date on 30-day screens) of the interval beginning is shown in the first column.

If more than five errored intervals have elapsed, Page-Dn appears to the left of the performance data. Pressing Enter on this field displays the next five errored intervals. Page-Up appears once Page-Dn is used. Pressing Enter on Page-Up displays the previous five errored intervals. Only intervals that contained errors are displayed, which eliminates rows of zeroes. If an interval is not displayed, no errors were detected during that time period.

The parameters shown on the Performance screens are updated at five-second intervals.

Per AT&T Technical Reference TR 54016, the Standard 24 Hour and Standard 30 Day performance data consists of Errored Seconds (ES), Unavailable Seconds (UAS), Bursty Errored Seconds (BES), Severely Errored Seconds (SES), Loss of Frame Count (LOFC), and Controlled Slip Seconds (CSS).

The Enhanced 24 Hour and Enhanced 30 Day screens show data for CRC Errored Seconds (CRCES), Out of Frame Seconds (OOFS), Loss of Signal Seconds (LOSS), Alarm Indication Signal Seconds (AISS), Remote Alarm Seconds (RAS), and Bipolar Violation Seconds (BPVS).

For generic TR 54016 far-end devices, only the standard telco 24-hour performance data is displayed. 30-day data is not available.

Table 4-3 Status Indications

Status	Description
-------	No status is available.
OK	No errors are detected.
ERR	Frame bit errors, CRC errors, or BPVs are detected.
LOS	A loss of signal condition exists.
OOF	An out of frame condition exists.
RAI	The far end is receiving a remote alarm indication signal.
AIS	The far end is receiving an alarm indication signal.
UAS	An unavailable signal state exists due to consecutive severely errored seconds.

Maintenance Screen

The Maintenance screen (Figure 4-6) allows performing test and maintenance functions on the T1 circuit. BERT is performed by using on-board test facilities. No other test equipment is needed. Actions initiated by each field are detailed in the following paragraphs.

Clear Tests

Pressing Enter on this field clears all tests and any line loops that have been initiated.

Clear Alarms

Pressing Enter on this field causes all near-end alarms to be cleared.

Test Loops

Loop status changes can be made only when the BERT function is not in the active mode. The type of loop is chosen by toggling the spacebar and is executed by pressing Enter.

T1 Loop

Used to select the test loops initiated. The normal operating mode and available loopback options are detailed in Figure 4-6.

T1 Unloop

Pressing Enter on this field takes down the specified loop.

FAR LLB

This switch allows selecting how in-band line loopback code is transmitted: framed or unframed per ANSI T1.403.

```
3030 DSU x.xx/x.xx                  PRISM 3030                    Date: MM/DD/YY
3030 DSU x.xx/x.xx               (Unit Address: 23)               Time: HH:MM:SS

------------------------------ ELEMENT MAINTENANCE -----------------------------

                                  Element: [    ]

                                           BERT               [T1 NET]
   (CLEAR TESTS)                           Pattern:           [QRSS]
   (CLEAR ALARMS)                          Test Length:       [15 min]

   T1 Loop:     [NET LLB][AIS ]            Pattern Sync:       IN SYNC
   T1 Unloop:   [DTE PLB]                  Elapsed Time:      01:15:00
   Far LLB:     [Unframed]                 Bit Errors:               5
   Port Loop:   [         ]
   Port Unloop: [         ]               Errored Seconds:          3
                                          % EFS:                 97.5


                                          (START TEST)
NET Status: OK                            (RESET ERRORS)
DTE Status: OK
Near Loops: -------/-------/-------/-------
Far Loops:  -------/-------

-----------------------------------Messages-----------------------------------
                                                                  Local Screen
```

Figure 4-6 Maintenance Screen

This does not activate the transmission of the loop code.

When FAR test is activated from the FAR/LOC front panel switch, the loopback code transmitted is framed or unframed depending on the setting of this field. The default is Framed.

Port Loop

Used to loop a high-speed DTE port at the near or far end (see Diagram 7 of Figure 4-8 on page 59) far-end loops use V.54 loop codes to activate. To enable the V.54 function, refer to V.54 Loop on page 67.

Port Unloop

Pressing Enter takes down the specified loop from the selected port.

BERT BERT

Specifies the direction the BERT signal is sent. If the direction is changed from the front panel, the new choice is not updated on the terminal interface until this screen is exited and then reentered. The choices are IDLE, T1 NET, T1 DTE, Channels 1–24, plus XY NET and XY DTE, where X = 2 or 3 and Y = A through F.

All testing must be stopped before channels can be reallocated to an active port.

Pattern

Specifies the pattern to be transmitted during a test. Modifying this field does not cause the pattern to be transmitted (refer to Start Test). The choices are QRSS, 63, 511, 2047, 2^{15}, 2^{20}, 2^{23},1:8, 3:24, ALT, and CLEAR. The CLEAR pattern passes the received data through the unit (alarm detection and reporting is disabled while the test is active).

Test Length

Defines the run-time of test pattern generation and error accumulation. The choices are Continuous, 15 min, 30 min, 60 min, and 24 hour.

Start Test

Pressing Enter with the cursor on this field starts the selected test pattern. TEST IN PROGRESS appears once the test has started. To end the test, press Enter on STOP TEST.

Reset Errors

Pressing Enter with the cursor on this field causes the test error results to be cleared to zero.

The following display-only fields reflect the selected test parameters and the results of these tests only.

Pattern Sync

Displays the state of pattern sync during a test. If no test is in progress, NO TEST is displayed. If a test is active, but the receiver is not in pattern sync, NO SYNC is displayed. If the receiver is in pattern sync, IN SYNC is displayed.

Elapsed Time

Displays the time elapsed since a timed test began or, if completed, the total test time.

Bit Errors

Displays the total number of bit errors detected since the test began or since error statistics were cleared (up to 999,999).

Errored Seconds

Displays the number of asynchronous errored seconds that have been detected since the test began or since error statistics were last cleared. This parameter includes bit error seconds and sync loss seconds.

% EFS

This ratio is derived from the number of error-free seconds divided by the number of seconds accumulated in Elapsed Time.

Line Fault and Loop Status

NET/DTE Status

Displays the fault status of the network and DTE. They are indicators of fault conditions and do not indicate that alarm thresholds are exceeded. Status indications are described in Alarm Indications on page 50.

Near Loops

Displays the loop status of the near element.

Far Loops

Displays the loop status of the far element.

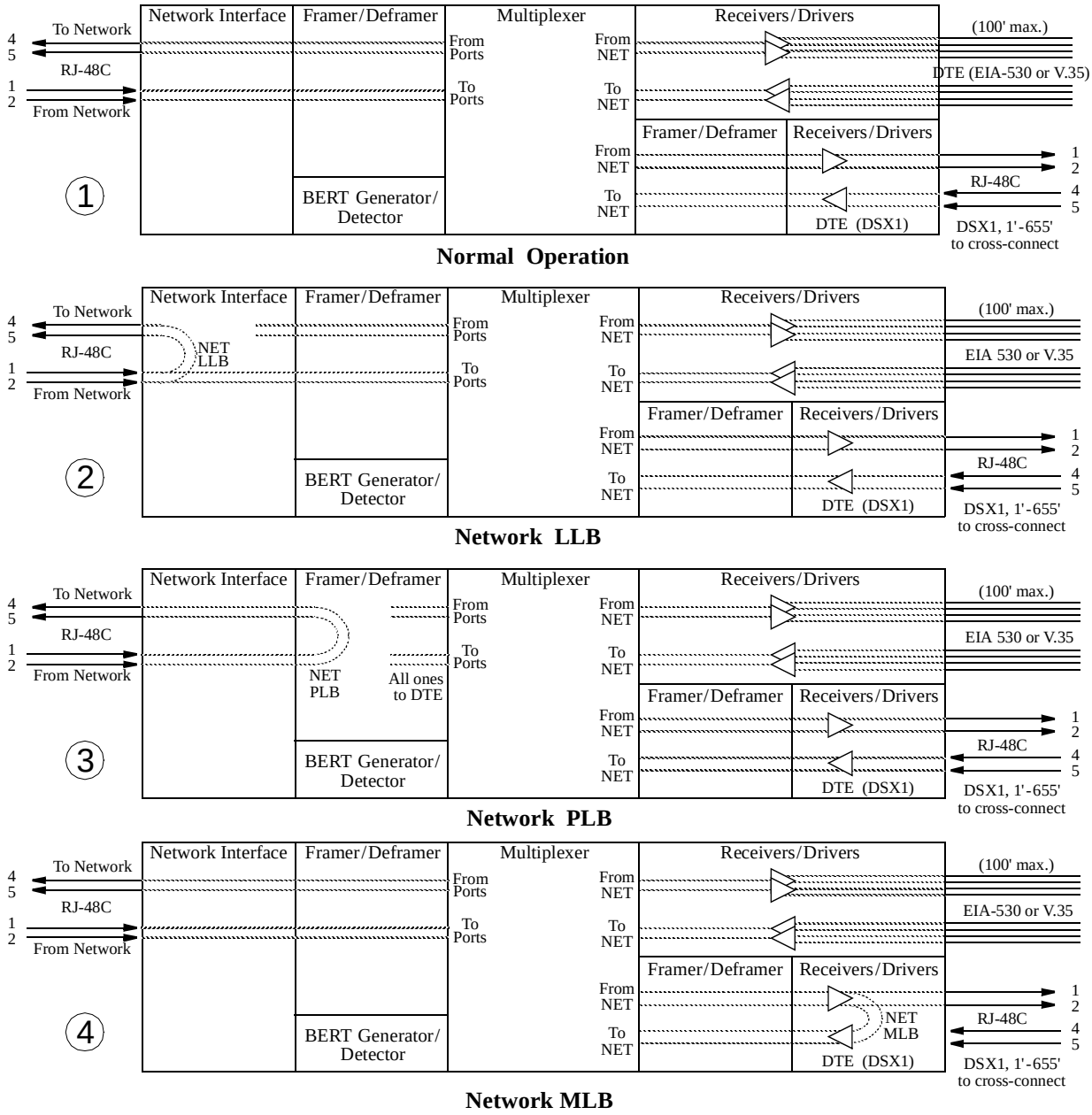


Figure 4-7 Loopback Diagrams

1 Normal Operation: This diagram depicts the unit's normal operating mode.

2 NET LLB: The network line loopback command loops data received from the network back toward the network. Received data is passed through to the DTE ports.

3 NET PLB: The network payload loopback command loops the network data back toward the network. Framing, CRC, and FDL are regenerated. Framed all ones are passed to the DTE ports.

4 NET MLB: The network maintenance loopback command loops data at the T1 DTE port back toward the network (passes network data to the DTE and return data to the network). MLB affects only network channels assigned to the T1 DTE.

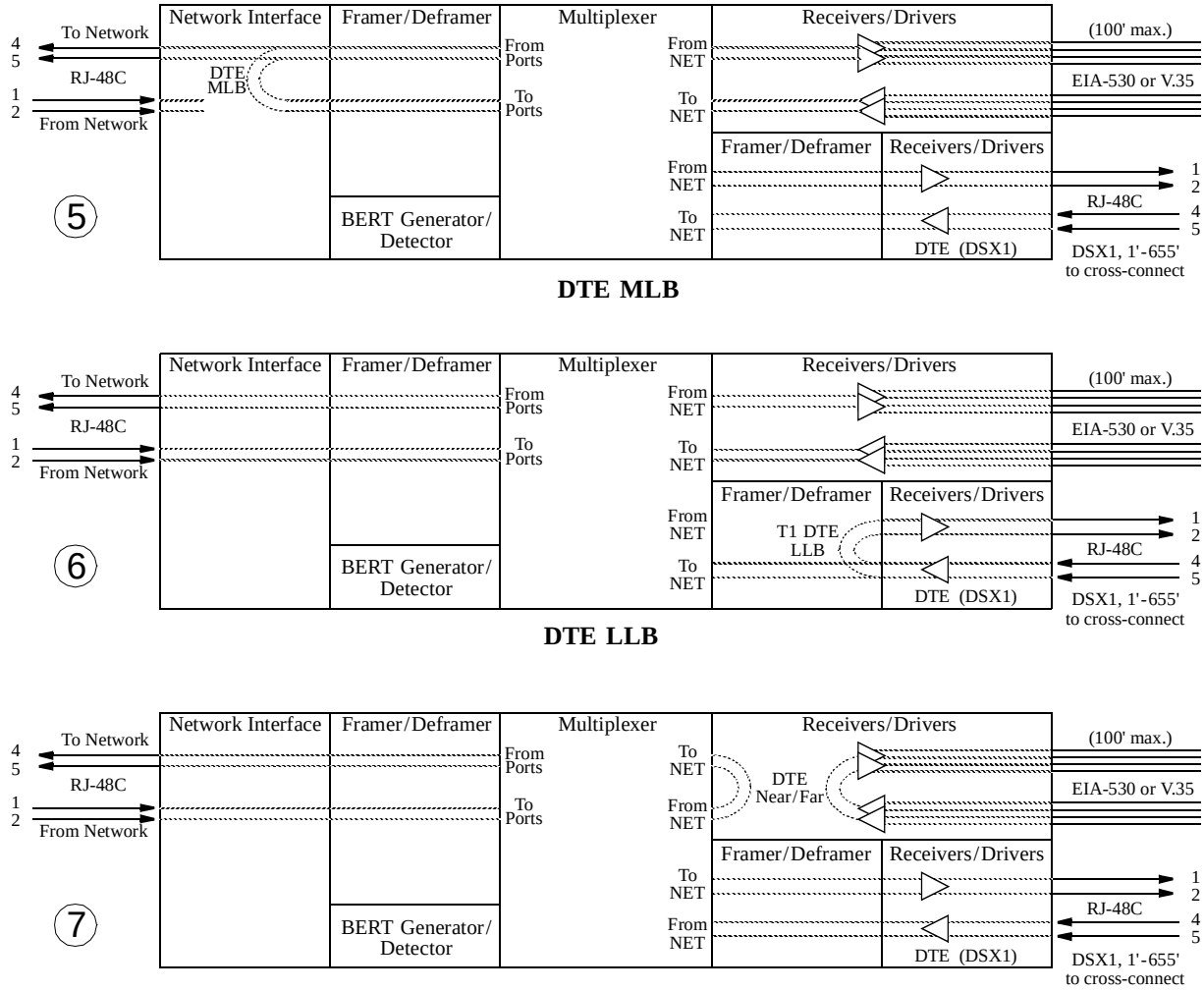


Figure 4-8 Loopback Diagrams

5 DTE MLB: The T1 DTE maintenance loopback command loops all network data back toward the DTE ports at the network interface. Data is passed through to the network. It is advisable to set T1-NET Timing to INTERNAL rather than NETWORK when this loop is enabled.

6 DTE LLB: The T1 DTE line loopback command loops data received at the T1 DTE interface back toward the T1 DTE (all DS0s are returned to the T1 DTE port). The T1 DTE data is also passed to the network.
FAR PLB: The far payload loopback command sends loop codes to the far-end unit to force it into a network payload loopback mode.
FAR LLB: The far line loopback command sends loop codes to the far-end unit to force it into a network line loopback mode.

7 Port Loop: Used to loop a high-speed DTE port at the near or far end. High-speed port loops are bidirectional.

Configuration Screens

The various Configuration screens allow viewing and setting configuration parameters for the network elements. Only the installed options are available as menu items.

To send a new configuration to the unit, press Enter on one of the fields or exit the screen. The underlined values are the factory default parameters stored in ROM.

Line Parameters

The Line Parameters screen (Figure 4-9) allows reviewing and setting line parameters for the selected element on the T1 circuit. The T1 DTE fields appear only in units with the T1 DTE option installed.

This screen has the following fields, most of which have user-selectable options. To send the new line configuration to the unit, either press Enter on one of the fields, change the Element selection, or exit the screen.

T1-NET Framing

Selects the type of framing for the network side of the element. The choices are ESF and D4.

T1-NET Line Code

Sets the network side line coding. The choices are AMI and B8ZS.

T1-NET LBO

Sets the line build out for the network interface. The choices are 0 dB, −7.5 dB, −15 dB, and −22.5 dB.

```
3030 DSU x.xx/x.xx                  PRISM 3030                    Date: MM/DD/YY
3030 DSU x.xx/x.xx              (Unit Address: 23)                Time: HH:MM:SS

-------------------------------- LINE PARAMETERS -------------------------------

                                   Element: [    ]

   T1-NET Framing:   [ESF     ]              Rem Comm Channel:  ( 0)
   T1-NET Line Code: [B8ZS]                  T1-DTE Framing:    [ESF      ]
   T1-NET LBO:       [0 dB    ]              T1-DTE Line Code:  [B8ZS]
   PRM Enable:       [DISABLE ]              T1-DTE DSX Level:  [0-110 FEET  ]
   Zero Suppression: [ENABLE  ]              T1-DTE Channel:    [ 2]
   T1-NET Timing:    [ENABLE  ]              Setting:           [THRU ]
   Station Timing:   [64k x   ] ( 1)         Signalling:        [ENABLE ]


                                   11---- ------ ------ ------
              Channel Allocation: **---- ------ ------ ------
              Signalling Enabled: XX---- ------ ------ ------



-----------------------------------Messages-------------------------------------
                                                                    Local Screen
```

Figure 4-9 Line Parameters Screen

PRM Enable

Allows the T1.403 Performance Report Message, which is sent once a second, to be turned on or off. The choices are ENABLE and DISABLE.

Zero Suppression

Determines whether ones density insertion is activated after 15 zeros (rather than 175 zeros). The choices are ENABLE and DISABLE.

T1-NET Timing

Sets the timing source to synchronize the unit's internal timing generators. In all cases, slips are controlled to occur on frame boundaries at the network and/or DSX1 ports when timing synchronization is lost.

NETWORK. Timing is derived from the network recovered clock (most applications use this selection).

STATION. Timing is derived from a bipolar- or TTL-compatible clock supplied to the unit at the rear panel STA CLK connector. When this mode is selected, the timing rate must also be set from Station Timing.

INTERNAL. The unit's internal frequency standard is used for all timing.

T1 DTE. The unit synchronizes to the clock recovered from the DSX1 T1 DTE port. This selection only appears on units equipped with the T1 DTE option.

SLOT X, PORT Y. Timing is synchronized to the external terminal timing clock supplied from the DTE and connected to the selected port.

Station Timing

Selects the input timing and only appears when Station is selected from the T1-NET Timing menu. The choices are N×56K, N×64K, and 1.544 MHz. A number appears to the right of this field when N×56K or N×64K is selected to indicate the rate multiplier. A value from 1 through 24 must be entered.

Remote Comm Channel

Selects a communication link to the far-end unit. If 0 is selected, communication is established over the ESF facility data link (valid only when the network interface is configured for ESF and the FDL has end-to-end integrity). For example, the entire T1 bandwidth must be available with no intervening multiplexers in the signal path blocking the FDL.

As an alternative, the communication link can be assigned to an unused idle channel. This option can be used whether the network is operating in a D4 or ESF mode.

When the remote communication is programmed to operate over a spare network channel, the following test conditions interrupt access to the far-end unit.

- A remote network LLB or PLB is initiated.
- A local network LLB is initiated.

- When the remote communication is programmed to operate over the facility data link (FDL), the following test conditions interrupt access to the far-end unit:
  - A remote network LLB is initiated.
  - A local LLB is activated on the near end.

If far-end communication is interrupted for any reason while accessing the remote unit, exit and then reenter this screen to ensure that all the parameters have been updated.

T1-DTE Framing

Selects the type of framing for the DTE side of the element. The choices are ESF and D4.

T1-DTE Line Code

Sets the DTE side line coding. The choices are AMI and B8ZS.

T1-DTE DSX Level

Specifies the DTE line build out signal level. The choices are 0–110 ft, 111–220 ft, 221–330 ft, 331–440 ft, 441–550 ft, 551–660 ft, and >660 ft.

D/I Start Channel

Selects the first channel in the block of channels assigned to the T1 DTE, from 1 through 24.

Setting

IDLE sets the specified channel to transmit idle code on the T1 DTE port and ignore received data. THRU sets the specified channel to pass data from the T1 DTE port to the network and vice versa.

Signalling

The signalling option allows selection of Clear Channel or Robbed Bit signalling for each DS0. Each DS0 is set to the Clear Channel (disable) mode. This setting should not be changed for raw data channels. However, channels using Robed Bit signalling ust be specified to enable proper handling of the signalling bits. T1-DTE channels must be set to THRU to enable signalling.

In the Signalling Enabled row at the bottom of Figure 4-9 on page 60, an X indicates that signalling is enabled for that channel.

Channel Allocation

Indicates the network channel assignments with Channel 1 on the left and Channel 24 on the right.

The top line identifies the slot number and the bottom line identifies the port number. A plus (+) sign in the slot position indicates either a remote communication link or the fill channels used for the alternate channel assignment mode. When channels are assigned to a port in the ALTERNATE mode (see DS0 Channel Assignment on page 66), each data channel is followed by a fill channel not assignable for other ports and marked with an x in the port position.

The T1 DTE port is identified with an asterisk (*) in the port position. The Remote Comm Link is identified with an R in the port position. Refer to the following example.

```
Channel                222222 2+2+2+ 333333 11111+
Allocation:            AAAAAA BXBXBX ABCDEF *****R
```

Slot 2, Port A is assigned to network channels 1 to 6 (contiguous) Slot 2, Port B is assigned to network channels 7 to 12 (alternating) Slot 3, Port A is assigned to network channel 13 (voice).
Slot 3, Port B is assigned to network channel 14 (voice).
Slot 3, Port C is assigned to network channel 15 (voice).
Slot 3, Port D is assigned to network channel 16 (voice).
Slot 3, Port E is assigned to network channel 17 (voice).
Slot 3, Port F is assigned to network channel 18 (voice).
Network channels 19 to 23 are mapped through to the T1 DTE.
Network channel 24 is assigned to the remote communication link.

Signalling Enabled

The signalling option allows selection of Clear Channel or Robbed Bit signalling for each DS0. Each DS0 is set to the Clear Channel DISABLE mode. This setting should not be changed for raw data channels. However, channels using Robbed Bit signalling must be specified to enable proper handling of the signalling bits. T1-DTE channels must be set to THRU to enable signalling.

In the Signalling Enabled row at the bottom of the screen, an X indicates that signalling is enabled for that channel.

Alarm Parameters

The Alarm Parameters screen (Figure 4-10) allows reviewing and setting alarm related thresholds for the selected element. These thresholds are the minimum acceptable performance levels. To modify the parameters, highlight the desired statistic, type in the new value (any number from 0 to 900) and press Enter. If this value is later surpassed, an alarm indication appears. A field set to 0 causes the element not to alarm on that statistic.

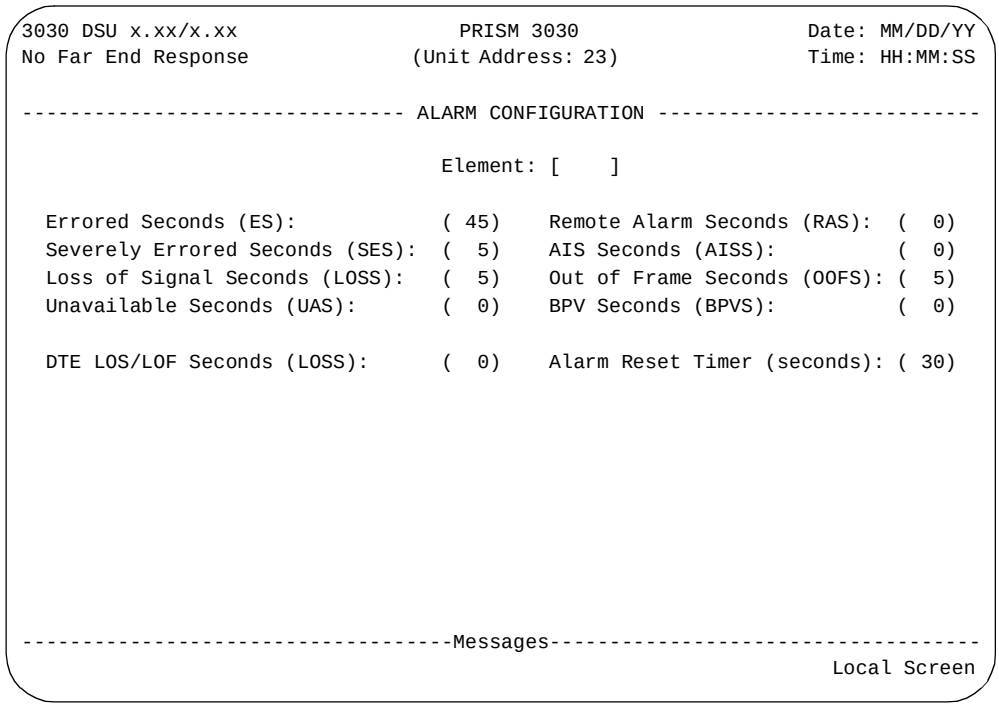

3030 DSU x.xx/x.xx
PRISM 3030
Date: MM/DD/YY
No Far End Response
(Unit Address: 23)
Time: HH:MM:SS
ALARM CONFIGURATION
Element: [ ]
Errored Seconds (ES): (45)
Remote Alarm Seconds (RAS): (0)
Severely Errored Seconds (SES): (5)
AIS Seconds (AISS): (0)
Loss of Signal Seconds (LOSS): (5)
Out of Frame Seconds (OOFS): (5)
Unavailable Seconds (UAS): (0)
BPV Seconds (BPVS): (0)
DTE LOS/LOF Seconds (LOSS): (0)
Alarm Reset Timer (seconds): (30)
Messages
Local Screen

Figure 4-10 Alarm Configuration Screen

If alarm thresholds are edited from the front panel, the corresponding values are not reflected on this screen until it is exited and then reentered.

Errored Seconds

A one-second period in which at least one logic error occurred.

Severely Errored Seconds

A one-second period in which at least 320 CRC errors or 1 OOF (out-of-frame) occurred.

Loss of Signal Seconds

A one-second period in which the T1 received signal is interrupted.

Unavailable Seconds

A one-second period in which consecutive severely errored seconds cause an unavailable state.

DTE LOS/LOF Seconds

A one-second period in which the T1 received signal (on the optional T1 DTE interface) is interrupted or the amplitude drops below a certain level.

Remote Alarm Seconds

Generated by the terminal equipment when an improper signal is received from the facility (or after receiving unframed all ones).

AIS Seconds

A one-second period in which all ones are received.

Out of Frame Seconds

A one-second period in which a frame sync loss occurred.

BPV Seconds

A one-second period in which at least one bipolar violation occurred.

Alarm Reset Timer

Determines the number of seconds after alarm conditions clear before indications are removed.

Port Parameters

The Port Configuration screen (Figure 4-11) sets the operating parameters for each high-speed port. The unit does not allow conflicting configurations for the DTE ports. Therefore, the selections for each menu item are restricted to those that do not conflict with the configuration of other high-speed ports or the T1 DTE Port. The default is all channels disabled.

When channel assignment changes are made to the high-speed ports, to the remote communication link, or to the T1 DTE, the unit reestablishes the mapping of all channels. This interruption to traffic normally results in a brief burst of data errors on other ports.

```
3030 DSU x.xx/x.xx                  PRISM 3030                  Date: MM/DD/YY
3030 DSU x.xx/x.xx              (Unit Address: 23)              Time: HH:MM:SS

------------------------------ PORT CONFIGURATION -----------------------------

                                  Element: [    ]

                                  222222 2+2+2+ 333333 11111+
              Channel Allocation: AAAAAA BXBXBX ABCDEF *****R

     Port #          [2A ]

     Rate Mult:      [N x 64k]
     DS0 Ch. Assign: [Alternate ]              V.54 Loop  : [Enable ]
                                               Invert Data: [No ]
     Start Ch. #:    ( 1)                      CTS Control: [Force True ]
     Port Rate:      [384 kHz  ]               DSR Control: [Force True ]
     # of Channels:   6                        DCD Control: [Force True ]

     Tx Clock:       [Internal  ]              Alarm on DTR Loss: [Disable]


-----------------------------------Messages-------------------------------------
                                                                   Local Screen
```

Figure 4-11 Port Configuration Screen

Channel Allocation

A detailed desription of this field is described in Channel Allocation on page 63.

Port

Selects the slot and port XY to be configured, where X=2 or 3 and Y=A to F.

Rate Multiplier

The unit can operate at any data rate that is a multiple of 56 or 64 kbps. When N×64K is selected, the ones density requirements of the T1 network line must be ensured. When N×56K is selected, the unit maintains ones density for the selected DS0 channel.

DS0 Channel Assignment

Selects whether the DTE channel assignment is made as a CONTIGUOUS group or as ALTERNATE channels. Selecting ALTERNATE assures ones density.

Start Channel

The starting channel in the 24-channel DS1 bit stream must be selected in this field. The unit then assigns the following channels automatically according to the bit rate and the mode selected in DS0 Channel Assignment. The choices are 1 through 24.

Port Rate

Selects the required port bit rate in increments of 56 or 64 kbps, depending on the Rate Multiplier setting. The N multiplier ranges in value from 0 to 24.

of Channels

Displays the number of channels to be passed through to the T1 DTE. This number is determined by the selection in Port Rate.

Transmit Clock

Used to select the clock that the unit uses to sample the data transmitted from the DTE. When set to INTERNAL, the data is sampled directly with the transmit data clock also supplied to the DTE as Transmit Clock. The EXTERNAL option uses the external clock supplied by the DTE. The OVERSAMPLED option is used to operate the port as a low-speed asynchronous port. In this mode, the port rate should be set to at least four times the asynchronous data rate (depending on the degree of allowable distortion for the particular DTE equipment used).

V.54 Loop

Selecting Enable allows the unit to respond to in-band V.54 loop commands. If Disable is selected, the unit ignores these commands.

Invert Data

In the invert mode (YES), transmit and receive data are inverted at the port interface. This function can be used to guarantee ones density when the data is composed of SDLC type protocols. The choices are YES and NO.

CTS/DSR/DCD Control

Setting any of these three fields to FORCE TRUE or FORCE FALSE allows the forcing of the port control lead output state. INTERNAL allows for normal operation as shown in Figure 3-12 on page 30.

Alarm on DTR Loss

Selecting Enable allows the unit to go into alarm on loss of DTR. The default setting is Disable.

TCP/IP Parameters

The TCP/IP Configuration screen (Figure 4-12) is accessible for the Ethernet or Token Ring SNMP interface. It allows for the entry of those parameters required for proper operation with an Ethernet or Token Ring-based LAN manager.

```
3030 DSU x.xx/x.xx                  PRISM 3030                  Date: MM/DD/YY
No Far End Response              (Unit Address: 23)             Time: HH:MM:SS

---------------------------- TCP/IP CONFIGURATION ----------------------------

Ethernet 255.255/X.XX
                                 Element: [NEAR]         (RESET LAN INTERFACE)

                          I.P. Address  (000.000.000.000)
                    Subnet Mask         (000.000.000.000)
                    Router I.P. Address  (000.000.000.000)

                    Filter I.P. Address  (000.000.000.000)
                    Filter I.P. Address  (000.000.000.000)
                    Filter I.P. Address  (000.000.000.000)
                    Filter I.P. Address  (000.000.000.000)
                    Filter I.P. Address  (000.000.000.000)
                    Filter I.P. Address  (000.000.000.000)
                    Filter I.P. Address  (000.000.000.000)



-----------------------------------Messages-------------------------------------
                                                                   Local Screen
```

Figure 4-12 TCP/IP Parameters Screen

Ethernet/Token Ring

If applicable, this field displays the Ethernet or Token Ring hardware/software revision level.

Element

Toggling this field with the spacebar accesses either the NEAR or FAR unit.

Reset LAN Interface

For changes to take effect, the unit must be restarted. Selecting this field brings up a confirmation screen that asks if you want to proceed with the reset.

PRISM IP Address

Accepts IP addresses. Each device connected to the LAN is required to have a unique IP address identifier.

Subnet Mask

Provided to manually override the subnet mask setting which is otherwise discovered by the SNMP agent.

Router IP Address

Accepts the IP address of the default router.

Filter IP Address

These eight fields accept the IP address of the source packet filter. If any of these fields are set, access is allowed only by the specified IP addresses.

SNMP Parameters

The SNMP Configuration screen (Figure 4-13) is accessible if the unit is equipped with the Ethernet or Token Ring SNMP interface. It allows for the entry of those parameters required for proper operation with an Ethernet or Token Ring-based LAN manager.

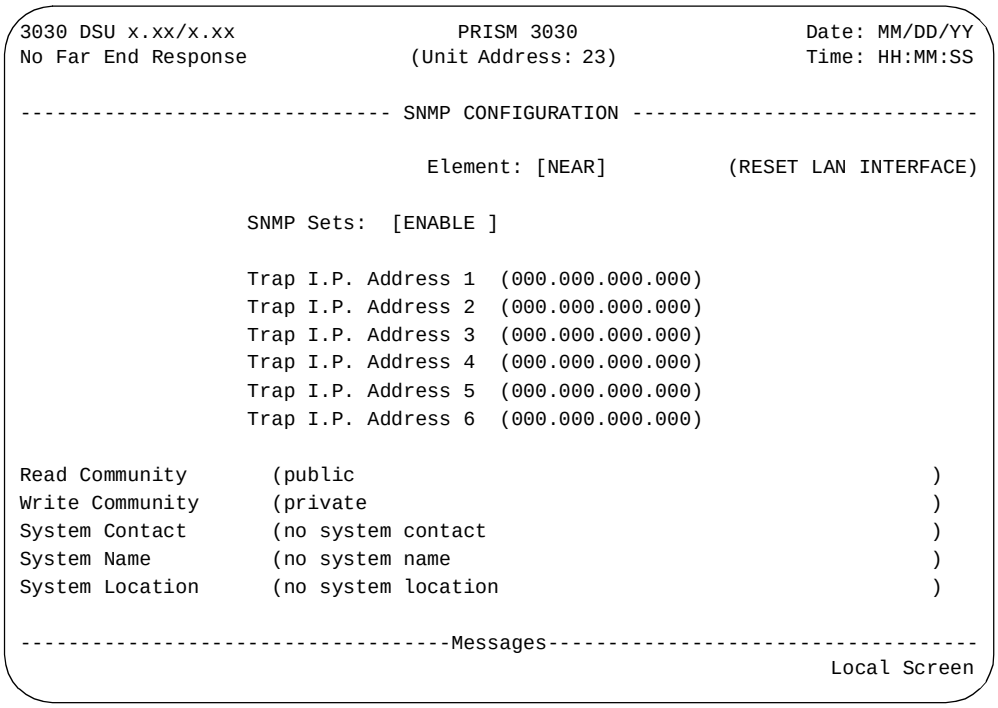


Figure 4-13 SNMP Parameters Screen

Element

Toggling this field with the spacebar accesses either the NEAR or FAR unit.

Reset LAN Interface

For changes to take effect, reset the LAN interface or cycle the unit's power. Selecting this field brings up a confirmation screen that asks if you want to proceed with the reset.

SNMP Sets

Enables or disables the set command responses. Refer to Appendix C for detailed information on these responses.

Trap IP Address

Accepts the IP address of a network device where alarm reporting traps are to be sent. Each of the four numbers range from 0 to 255 and is separated by a period.

The unit detects and reports T1 network alarms and provides several options for reporting them, one of which is SNMP traps. When a network alarm occurs, the unit sends a trap message to up to 6 destinations on the user's network. The trap message is formatted per RFC 1157. The generic trap type is enterpriseSpecific (generic-trap = 7).

When an alarm group is defined to report via SNMP, up to six Trap IP addresses can be assigned. The unit reports each alarm by transmitting an SNMP Trap to each Trap IP address. T1 network problems often cause more than one alarm type. In these cases, multiple trap messages are generated, each with a different specific trap type. The specific-trap field of each trap message is set to one of the values shown in Table 4-4.

Table 4-4 Trap Definitions

Cleared Near	Cleared Far	Alarmed Near	Alarmed Far	Description
4	54	104	154	DTE CRCES
5	55	105	155	DTE BPVS
6	56	106	156	DTE AISS
7	57	107	157	DTE RAS
8	58	108	158	DTE UAS
9	59	109	159	DTE OOFS
10	60	110	160	DTE LOSS
11	61	111	161	DTE CSS
12	62	112	162	DTE SES
13	63	113	163	DTE ES
14	64	114	164	NET CRCES
15	65	115	165	NET BPVS
16	66	116	166	NET AISS
17	67	117	167	NET RAS
18	68	118	168	NET UAS
19	69	119	169	NET OOFS
20	70	120	170	NET LOSS
21	71	121	171	NET CSS
22	72	122	172	NET SES
23	73	123	173	NET ES
24	74	124	174	Device Reset

The following five menu items require the entry of up to 255 characters identifying the appropriate group, person, device function, or unit location.

Read Community

Accepts a character string identifying the group authorized to perform read operations. The default setting is public.

Write Community

Accepts a character string identifying the group authorized to perform write operations. The default setting is private.

System Contact

Accepts a character string identifying the person responsible for a network device. The default setting is no system contact.

System Name

Accepts a character string identifying the functionality of the network device. The default setting is no system name.

System Location

Accepts a character string identifying the physical location of network device. The default setting is no system location.

Voice Parameters

The Voice Port Configuration screen (Figure 4-14) allows the assignment of voice DS0s to network channels. Only the voice ports with the Mode parameter set to Active are connected to the selected network channel. Each voice port option module has six voice circuits, which are independently assignable to a selected network channel. For a detailed description of the voice port operation, refer to Appendix B.

```
3030 DSU x.xx/x.xx                  PRISM 3030                    Date: MM/DD/YY
3030 DSU x.xx/x.xx              (Unit Address: 23)                Time: HH:MM:SS
------------------------ PRISM Voice Port Configuration -----------------------

                               Element: (NEAR)
                                  Slot: (3)
                             Card Type: FXS

                                                                  Delay   Tx Gn  Rx Gn
Port DS0  Mode     State       Name/ID          Sig.              Secs.      dB     dB
-------------------------------------------------------------------------------
A    (13) [ACTIVE] BUSY  (DS0 13             ) [FXS/LS   ]       [-4.0]  [ -6]
B    (14) [ACTIVE] BUSY  (DS0 14             ) [FXS/GS   ]       [-4.0]  [ -6]
C    (15) [ACTIVE] BUSY  (                   ) [MEG/LS   ]        [  0]  [ -6]
D    (16) [ACTIVE] BUSY  (                   ) [MEG/GS   ]        [  0]  [ -6]
E    (17) [ACTIVE] BUSY  (                   ) [PLAR     ]        [  0]  [ -6]
F    (18) [SPARE ] IDLE  (                   ) [FXS/LS   ]       [-4.0]  [ -6]

                               222222 2+2+2+ 333333 11111+
            Channel Allocation: AAAAAA BXBXBX ABCDEF *****R

                           Firmware Revision: x.xx
-----------------------------------Messages-----------------------------------
                                                                   Local Screen
```

Figure 4-14 Voice Port Configuration Screen

Slot

Displays the voice parameters for a particular slot and allows selecting another applicable slot.

Card Type

Various types of voice port modules are available with the following default parameters (see Voice Port Configuration on page 32).

Port

Displays the ports available for the selected slot.

DS0

Assigns the voice port to a network channel. The choices are 1 through 12.

Mode

Selects whether the voice port is actively assigned to a network channel (Active) or is not used. When set to Spare, the other voice parameters are ignored and the port is inactive. The port must be set to the Spare mode before it can be assigned to another channel. On E&M modules, select Active4w, Active2w, or Spare.

State

Displays the voice port status as either Busy or Idle.

Name/ID

Can be used to enter up to 20 alphanumeric characters for identifying the voice circuit name and number.

Signalling

Selects the supervisory operation of the voice port. The choices for the different modules are as follows.

FXS.

FXS/LS:	Foreign Exchange Station/Loop Start
FXS/GS:	Foreign Exchange Station/Ground Start
UVG:	Universal Voice Grade
MEG/LS:	MEGACOM/Loop Start
MEG/GS:	MEGACOM/Ground Start
MEGR/LS:	MEGACOM/Loop Start with Reverse Battery
MEGR/GS:	MEGACOM/Ground Start with Reverse Battery
PLAR:	Private Line Automatic Ringdown
SLC 96:	SLC 96 Channel Signalling
DID/DNIS:	Direct Inward Dialing/Dialed Number Identification Service [Dial Pulse Originate (DPO) mode]
DNISW/LS:	Loop Start DNIS (LS-DNIS) with wink
DNISD/LS:	LS-DNIS with delay start
DNISWR/LS:	LS-DNIS with wink and Reverse Battery
DNISDR/LS:	LS-DNIS with delay and Reverse Battery
DNISW/GS:	Ground Start DNIS (GS-DNIS) with wink
DNISD/GS:	GS-DNIS with delay start
DNISWR/GS:	GS-DNIS with wink and Reverse Battery
DNISDR/GS:	GS-DNIS with delay and Reverse Battery

FXO.

FXO/LS:	Foreign Exchange Office/Loop Start
FXO/GS:	Foreign Exchange Office/Ground Start
FXO UVG:	Foreign Exchange Office/Universal Voice Grade
FXO UVGR:	Foreign Exchange Office/Universal Voice Grade with Reverse Battery
DID/DNIS:	Direct Inward Dialing/Dialed Number Identification Service [Dial Pulse Terminate (DPT) mode]

4-Wire E&M.

		F-3010-200--112	*F-3010-200--114*
Type I:	Signalling	Yes	Yes
Type II:	Signalling	Yes	Yes
Type III:	Signalling	Yes	Yes
Type IV:	Signalling	No	Yes
Type V:	Signalling	No	Yes
TO:	Transmission Only	Yes	Yes

Delay Seconds

If signalling mode has a delay, it can be set from 1 to 5 seconds.

Tx Gain

Selects the transmit gain over the following ranges:

2-Wire FXS:	– 4.0 dB fixed
2-Wire FXO:	– 6 dB to 0 dB
4-Wire E&M:	–14 dB to +2 dB

Rx Gain

Selects the receive gain over the following ranges:

2-Wire FXS:	–11 dB to 0 dB
2-Wire FXO:	– 6 dB to 0 dB
4-Wire E&M:	–18 dB to –1 dB

Channel Allocation

Described in detail in Channel Allocation on page 63.

Firmware Revision

Identifies the revision level of the firmware that resides on the voice option module.

Utilities Screen

The Utilities screen (Figure 4-15) handles the functions described in the following paragraphs.

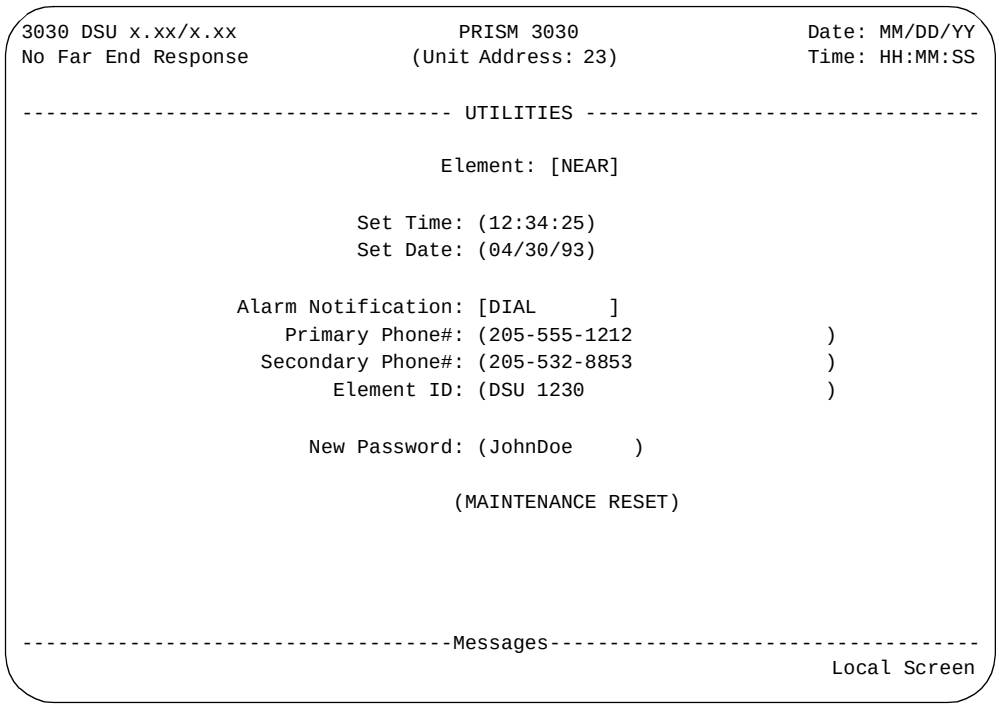


Figure 4-15 Utilities Screen

General Functions

Set Time

Set the time using the 24-hour HH:MM:SS format. For example, 3:45 a.m. is entered as 0345 and 3:45 PM is entered as 1545.

Set Date

Set the date using the MM:DD:YY format. For example, July 4, 1993 is entered as 070493.

The time and date can be set at the far end, but not displayed.

New Password

Allows entry of a password of up to 10 characters. An empty string (carriage return only) disables the password feature. After Enter is pressed, the new password is activated and is no longer visible. Therefore, type carefully when entering a new password and verify before pressing Enter. When the terminal interface is exited and later reactivated, this password must be entered exactly to gain access. If the wrong password is entered, the following message appears.

```
Incorrect Password; Please Enter Again.
```

Do not exit the terminal interface program until the password procedure is fully understood. If a password has been specified, it must be typed exactly to reenter the program.

If a password is programmed and later forgotten, the password can be cleared through the front panel maintenance reset (see Maintenance Reset on page 22).

The reset operation sets all parameters to the factory default settings and zeros all performance registers. If the reset operation is not a satisfactory option, then call Verilink Customer Support for a one-time-use back door password (see Ordering Numbers on page 121).

Maintenance Reset

Clear all user-selectable parameters, performance registers, passwords, and alarms. All alarm threshold parameters is reset to default values. The unit reloads start-up configuration settings from the default parameters stored in ROM. Pressing Enter on this field brings up a warning prompt asking whether or not to perform the reset function.

COA Parameters

The following fields pertain only to call on alarm functions.

Alarm Notification

Controls the remote alarm reporting. The choices are as follows.

OFF. Disables alarm reporting.

DIRECT. Sends reports to a printer or terminal connected directly to the supervisory port.

DIAL. Sends reports through an attached AT command set compatible modem connected to the SUPV serial port, which must dial out to a remote modem. The message format is described in the Element ID field.

DIAL NMS. Sends reports through a modem to an 8100A.

Primary Phone#, Secondary Phone#

ASCII strings for the primary and secondary call on alarm phone numbers used in the DIAL and DIAL NMS modes. The strings must not include the ATDT command prefix.

The unit makes three attempts to connect using the primary number. If all three attempts fail, the unit makes three attempts to connect using the secondary number (if it is not blank). If the secondary number fails, the unit waits five minutes and then attempts to communicate using the primary number again. When a connection is detected, the unit outputs the notification message and disconnects.

Element ID

Allows the entry of an ASCII string (29 characters in length) which identifies the unit to the device receiving the alarm notification messages.

Call on alarm messages are reported in the following format in the DIAL or DIRECT modes only.

```
Element ID HH:MM:SS MM/DD/YY CR LF
NET Alarms: alarms CR LF
DTE Alarms: alarms CR LF
```

where (alarms) is a string consisting of some or all of the identifiers LOS, OOF, RAS, AIS, UAS, ERRS, or the word NONE. The following is an example.

```
Joesunit 17:24:55 08/04/93
NET Alarms: LOS AIS ERRS
DTE Alarms: LOS 2A 2B 3A 3B
```

The user-programmable Element ID string is transmitted first to allow the COA function to send a message with a specific meaning to some host (such as a log-on message).

The identifier ERRS represents an alarm caused by ES, SES, and/or BPV errors.

Telnet Option

Telnet expands the Ethernet or Token Ring capabilities of the unit. Any Telnet-compatible station emulating an ANSI VT100 terminal can communicate with the unit. Fractional loopback and BERT can be initiated and monitored from any Telnet-compatible device in the wide area network (WAN). Note that only a single Telnet session is supported at any one time.

A familiarity with Telnet operation is necessary to communicate with the unit (refer to the Telnet documentation). The Telnet interface provides security through password layers identical to those described in this chapter for the terminal interface. Once communication is established, all Telnet screens are identical to those described for the terminal interface.

A PINOUTS AND INTERFACE SPECIFICATIONS

Table A-1 Interface Comparison Chart

Common Name	ITU Circuit	V.35 (34-Pin)	EIA-530 Circuit	EIA-530 (25-Pin)	RS-449 (37-pin)	RS-232 (25-pin)
Frame Ground	101	A	Shield	1	1	1
Signal Ground	102	B	AB	7	19	7
Transmit Data (A)	103 (A)	P	BA (A)	2	4	
Transmit Data (B)	103 (B)	S	BA (B)	14	22	2
Receive Data (A)	104 (A)	R	BB (A)	3	6	
Receive Data (B)	104 (B)	T	BB (B)	16	24	3
Request to Send (A)	105		CA (A)	4	7	
Request to Send (B)	105	C	CA (B)	19	25	4
Clear to Send (A)	106		CB (A)	5	9	
Clear to Send (B)	106	D	CB (B)	13	27	5
Data Set Ready (A)	107		CC (A)	6	11	
Data Set Ready (B)	107	E	CC (B)	22	29	6
Data Term Ready (A)	108		CD (A)	20	12	
Data Term Ready (B)	108	H	CD (B)	23	30	20
Data Carrier Detect (A)	109		CF (A)	8	13	
Data Carrier Detect (B)	109	F	CF (B)	10	31	8
Transmit Clock (A)	114 (A)	Y	DB (A)	15	5	
Transmit Clock (B)	114 (B)	AA	DB (B)	12	23	15
Receive Clock (A)	115 (A)	V	DD (A)	17	8	
Receive Clock (B)	115 (B)	X	DD (B)	9	26	17
Terminal Timing (A)	113 (A)	U	DA (A)	24	17	
Terminal Timing (B)	113 (B)	W	DA (B)	11	35	24

Table A-2 V.35 Pin Assignments

Circuit (See Note 1)	Pin # (See Note 2)	Signal Name	Abbr.	DCE I/O
101	A	Protective Ground	FG	Ground
102	B	Signal Ground	SG	Ground
103	P/S	Transmit Data	TD	In
104	R/T	Receive Data	RD	Out
105	C	Request To Send	RTS	In
106	D	Clear To Send	CTS	Out
107	E	Data Set Ready	DSR	Out
108/2	H	Data Terminal Ready	DTR	In
109	F	Data Carrier Detect	DCD	Out
113	U/W	External Transmit Clock	ETC	In
114	Y/AA	Transmit Clock	TC	Out
115	V/X	Receive Clock	RC	Out

Note 1: Only circuits serviced by the unit are listed.

Note 2: When two pins are listed, the first is the A differential pin and the second is the B differential pin.

The connector is a standard 34-pin female V.35.

All balanced bipolar inputs and outputs meet the physical and electrical specifications at ITU V.35.

All unbalanced bipolar inputs and outputs meet the physical and electrical specifications of ITU V.28.

Table A-3 V.35 Interface Specifications

Characteristics	Specifications
Balanced Drivers	
Voltage Swing	± 0.55 V (± 20%) into 100 Ω resistive load at < 0.2 VDC offset
Source Impedance	50 Ω (± 10%)
Rise Time	± 10% of UI to minimum of 40 ns
Balanced Receivers	
Load Impedance	100 Ω (± 10%)
Resistance from shorted terminals to ground	150 Ω (± 10%)
Differential Input Voltage	> ± 0.2V
Unbalanced Drivers (RS-232/V.28)	
Output Voltage	10.0 V peak (± 0.5 V)
Output Impedance	300 Ω minimum
Slew Rate	30 V per µsec maximum
Short Circuit Current	12 mA maximum
Mark Voltage (1 or Off)	0.0 V maximum
Space Voltage (0 or On)	+ 5.0 V minimum
Unbalanced Receivers (RS-232/V.28)	
Input Voltage	± 25 V maximum
Load Impedance	3000 Ω–7000 Ω
Mark Voltage (1 or Off)	0.0 V maximum
Space Voltage (0 or On)	+ 2.0 V minimum

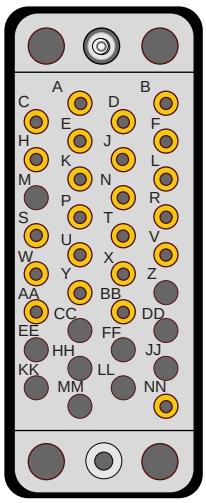


Figure A-1 Winchester-type Connector

Table A-4 RS-232 Pin Assignments

Circuit (Note 1)	Pin #	Signal Name	Abbr.	DCE I/O
101	1	Frame Ground	FG	Ground
102	7	Signal Ground	SG	Ground
103	2	Transmit Data	TD	In
104	3	Receive Data	RD	Out
105	4	Request To Send	RTS	In
106	5	Clear To Send	CTS	Out
107	6	Data Set Ready	DSR	Out
108/2	20	Data Terminal Ready	DTR	In
109	8	Data Carrier Detect	DCD	Out
110	21	Signal Quality	SQ	Out
113	24	External Transmit Clock	ETC	In
114	15	Transmit Clock	TC	Out
115	17	Receive Clock	RC	Out
125	22	Ring Indicator	RI	Out
140	14	Remote Loop	RL	In
141	18	Local Loop	LL	In
142	25	Test Mode (Busy)	TM	Out

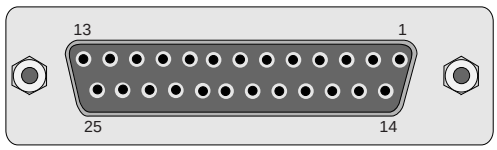


Figure A-2 DB-25 Connector

Table A-5 RS-232 Interface Specifications

Characteristics	Specifications
Line Drivers	
Output Voltage	±10 Volts maximum
Mark Voltage (Off)	<−5 V (±0.5 V) into 3000 Ω
Space Voltage (On)	>+5 V (±0.5 V) into 3000 Ω
Output Impedance	300 Ω minimum
Short Circuit Current	12 mA maximum
Line Receivers	
Input Voltage	±25 V maximum
Load Impedance	3000 Ω minimum
Mark Voltage (Off)	−25 to 0 VDC
Space Voltage (On)	+2 to +25 VDC

Note: Only circuits serviced by the unit are listed.

The RS-232 interface is only recommended for data rates of 128 kHz and below.

The connector is a standard female DB-25.

All unbalanced bipolar inputs and outputs meet the physical and electrical specifications of ITU V.28.

Table A-6 RS-449/422 Interface Specifications

Characteristics	Specifications
RS-449/422 Drivers	
Source Impedance	<100 Ω
Differential Output Voltage	between 2 to 6 VDC offset at 2.5V (< +0.5V and >−0.5 V) optional for MIL-STD-114
Short Circuit Current	<150 mA
Output Rise Time	<20 nanoseconds
RS-449/422 Receivers	
Impedance	100 Ω terminated
Differential Input Voltage	>+0.5 V or <−0.5 V
Data	
Data Mark (binary 1 or OFF state)	A terminal more negative than the B terminal
Data Space (binary 0 or ON state)	A terminal more positive than the B terminal

Table A-7 EIA-530 Interface Specifications

Signal Name	Abbreviation	Pin #
Shield	-----	1
Transmitted Data	BA (A) / BA (B)	2 / 14
Received Data	BB (A) / BB (B)	3 / 16
Request to Send	CA (A) / CA (B)	4 / 19
Clear to Send	CB (A) / CB (B)	5 / 13
DCE Ready	CC (A) / CC (B)	6 / 22
DTE Ready	CD (A) / CD (B)	20 / 23
Signal Ground	AB	7
Received Line Signal Detector	CF (A) / CF (B)	8 / 10
Transmit Signal Element Timing (DCE Source)	DB (A) / DB (B)	15 / 12
Receiver Signal Element Timing (DCE Source)	DD (A) / DD (B)	17 / 9
Transmit Signal Element Timing (DTE Source)	DA (A) / DA (B)	24 / 11

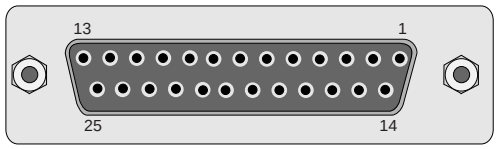


Figure A-3 DB-25 Connector

Table A-8 EIA-530 to RS-449 Pin Assignments

DB-25 Male Pin #	Signal Name	DB-37 Pin #
1	Shield Ground	1
2	Send Data (A)	4
14	Send Data (B)	22
3	Receive Data (A)	6
16	Receive Data (B)	24
4	Request to Send (A)	7
19	Request to Send (B)	25
5	Clear to Send (A)	9
13	Clear to Send (B)	27
6	Data Mode (A)	11
22	Data Mode (B)	29
8	Receiver Ready (A)	13
10	Receiver Ready (B)	31
15	Send Timing (A)	5
12	Send Timing (B)	23
17	Receive Timing (A)	8
9	Receive Timing (B)	26
20	Terminal Ready (A)	12
23	Terminal Ready (B)	30
24	Terminal Timing (A)	17
11	Terminal Timing (B)	35
7	Signal Ground	19

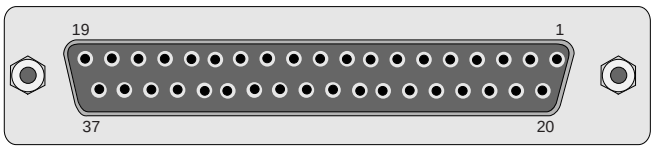


Figure A-4 DB-37 Connector

B FXS VOICE APPLICATION MODULE

Applications

The FXS Voice application module is used to interface up to six pieces of analog telephone equipment (telephones or key equipment) to a T1 facility (DS0). Refer to Figure B-1.

The module supports loop or ground start signalling (covered in the following paragraphs). These signals are converted to robbed bit A/B T1 signalling.

The FXS voice application module supports:

- Receive loss of 0 dB to −11 dB
- Transmit −4.0 dB fixed
- Sequential bandwidth (DS0s)
- μ-law PCM encoding

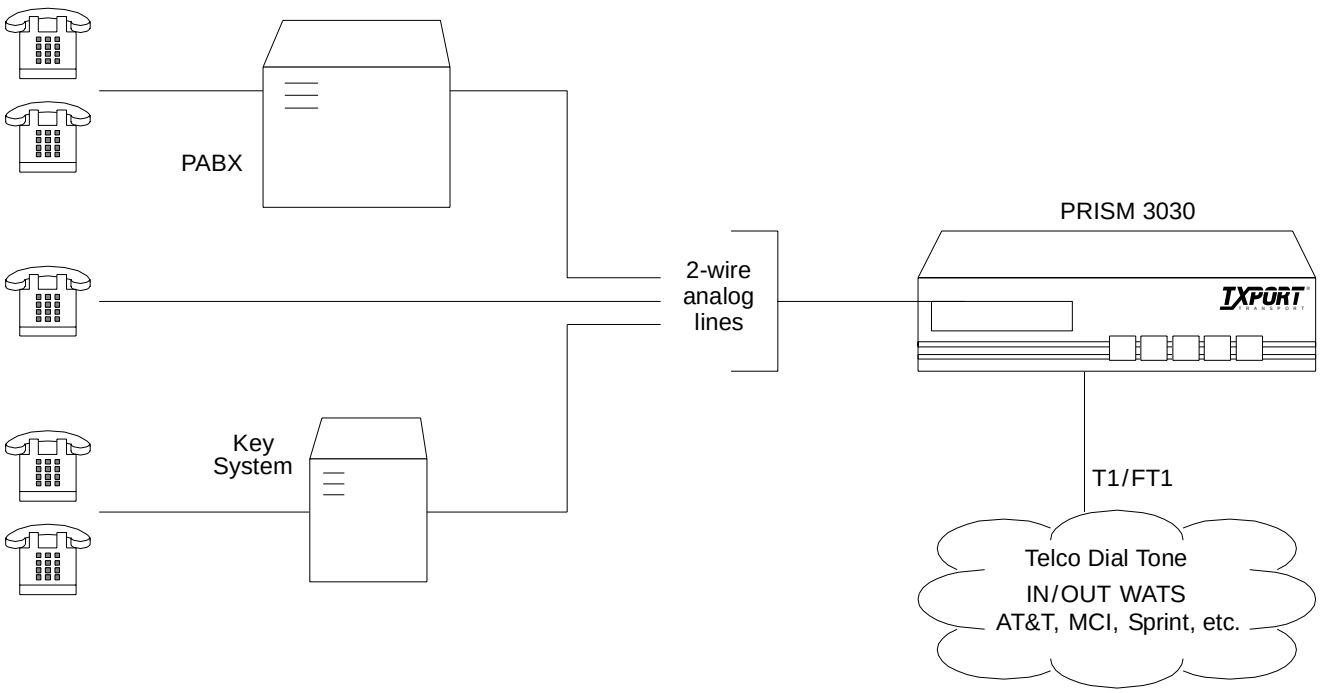


Figure B-1 FXS Voice Module Applications

Loop Start Signalling (FXS)

Idle

The application module has ground applied to the tip conductor and has −48 VDC applied to the ring conductor towards the 2-wire loop. The 2-wire loop is open (no DC path between the tip and ring conductors). The transmit A bit is set to 0 and the B bit is set to 1. The receive A bit (from the FXO application module) is set to 0 and the B bit is set to 1.

Ringing

During ringing, the office end (FXO) changes the state of the B bit from a 1 to a 0 and holds the A bit to a 0. The FXS application module detects the change in state of the B bit and reacts by applying the ring generator to the 2-wire loop.

The ringing cadence (typically two seconds on and four seconds off) is provided from the office end and is controlled by the 0 or 1 state of the B bit. The phone rings until the call is abandoned by the calling party (FXO end) or the called party goes off-hook.

Off-Hook/ Ring Trip

During ringing, the FXS application module is looking for an off-hook (loop closure) condition. When the FXS detects the off-hook, the FXS application module sets the A bit from a 0 to a 1. The B bit remains set at 1.

FXO Answer Supervision

The change in the state of the receive A bit status from a 0 to a 1 causes the FXO to place a loop closure on the 2-wire path toward the CO switch. This loop closure trips the CO ringing and cuts through the voice path. The call is now complete.

Call Request

The user goes off-hook at the FXS end. The FXS unit detects the off-hook and signals the office end by changing the state of the A bit from a 0 to a 1. The B bit remains set at 1. The FXO application module responds by placing a loop closure on the 2-wire towards the CO switch. The CO switch responds by returning dial tone to the FXS end. The user detects a dial tone and dials out using either dial pulse or DTMF. The dial pulse toggles the state of the A bit at a rate of 10 pulses per second (60 percent make and 40 percent break).

Ground Start Signalling (FXS)

Idle

The FXS application module has the tip conductor open and −48 VDC applied to the ring conductor toward the 2-wire loop. The 2-wire loop is open (no DC path between the tip and ring conductors). The transmit A bit is set to 0 and the transmit B bit is set to 1. The receive A bit equals 1 and the receive B bit is ignored.

Outgoing Call (toward T1 Carrier)

The ring conductor is grounded by the CPE equipment on the 2-wire loop. This causes the FXS application module to transmit both A and B signalling bits equal to a 0. The network equipment responds and the FXS application module receives a signalling bit equal to 0 and a B signalling bit equal to 1.

The received signalling state causes the FXS application module to ground the tip toward the CPE equipment. The CPE equipment removes the ring ground within 210 milliseconds. Within 1 millisecond after removing the ring ground, the CPE equipment provides loop closure on the 2-wire loop. The FXS application module transmits both A and B signalling bits equal to 1 and enables the audio path.

Loop status of the CPE equipment is then transmitted toward the network equipment by the FXS application module using the A signalling bit (0 equals loop open and 1 equals loop closed). Dial pulses are transmitted transparently from the CPE to the network equipment in this manner.

Call Terminated by CPE

The CPE opens tip to ring termination which causes the FXS application module to transmit signalling bit A equal 0 and signalling bit B equal 1 towards the network equipment. After a time-out period, the network equipment determines that the CPE has disconnected. The network equipment then responds and the FXS receives an A bit equal 1 and ignores the B bit. This causes the FXS application module to open the tip, which is the idle state.

Ground Start Incoming Call (from network to CPE)

In an idle state, the FXS application module sees the following.

- From the network, the received A bit equal to a 1 and the B bit ignored
- The tip is open toward the CPE
- No ring conductor ground from the CPE
- No loop termination from the CPE.

Upon incoming seizure from the network, the FXS application module receives an A bit equal to 0. The FXS application module grounds the tip conductor towards the CPE. The reception of a B bit equal to 0 causes the FXS application module to send ring voltage to the CPE. When the CPE terminates the loop, the FXS transmits both A and B signalling bits equal to 1 toward the network, terminates ringing, and enables the audio path.

Ground Start Call Termination (CPE end)

The CPE removes loop termination which causes the FXS application module to transmit the A signalling bit equal to a 0 and the B signalling bit equal to a 1. The network equipment returns an A signalling bit equal to 1. When the FXS receives the A signalling bit equal 1, it opens the tip conductor toward the CPE.

Ground Start Call Termination (by the network)

With both the CPE and the network in *conversation* mode and *off hook*, the FXS application module is providing −48 VDC on ring and ground on tip toward the CPE. The CPE is providing a loop closure toward the FXS application module. The FXS application module is transmitting A and B bits equal to 1 toward the network. The FXS application module is receiving A bits equal to 0 and B bits equal to 1 from the network.

When the network disconnects, the FXS application module receives an A bit equal to 1 (B is ignored) from the network. The FXS application module then

removes the ground from the tip toward the CPE and sends an A bit equal 0 and a B bit equal 1 toward the network. This is the idle state.

Loop Start Signalling (MEGACOM)

Idle State

The FXS application module applies the tip ground and −48 VDC on the ring towards the CPE. The CPE tip and ring is open toward the FXS. The FXS transmits A and B signalling bits = 0 toward the network, receives an A bit = 0, and ignores the B bit from the network.

Call Originated from Network

The FXS application module receives an A bit = 1 from the network and responds by transmitting both A and B signalling bits = 1 for 200 ms before returning A and B signalling bits = 0. The FXS applies ring voltage towards the CPE and transmits the ring back tone towards the network, coincident with the ring cadence.

CPE Answer

The CPE terminates tip to ring in response to the ring voltage. The FXS recognizes the loop termination, removes ring voltage and ring back tone, enables the audio path, and transmits both A and B signalling bits = 1 towards the network.

CPE Disconnect

The CPE removes the loop termination toward the FXS. The FXS transmits both A and B signalling bits = 0 toward the network. The network responds and the FXS receives an A signalling bit = 0 and ignores the B bit. This is the *idle* state.

Network Disconnect

From the network, the FXS receives an A signalling bit = 0 and ignores the B bit. The FXS responds by transmitting both A and B signalling bits = 0 toward the network and removing tip ground for 500 ms toward the CPE. The CPE removes tip to ring termination. This is the *idle* state.

Call Originated from DTE

The CPE applies termination between the tip and ring towards the FXS. The FXS transmits A and B signalling bits = 1 toward the network. The network returns a dial tone. The CPE then dials the number. The FXS receives an A signalling bit = 1 and ignores the B bit when the network answers.

Loop or Ground Start Signalling with Reverse Battery (MEGACOM)

This is the same as for Loop Start or Ground Start MEGACOM except that when a CPE-originated call connects, reverse battery is applied to the CPE tip and ring leads.

Ground Start Signalling (MEGACOM)

Idle State

The FXS application module has the tip open and −48 VDC on the ring towards the CPE. The CPE has tip and ring open toward the FXS. The FXS transmits both A and B signalling bits = 0 toward the network, receives an A bit = 0, and ignores the B bit from the network.

Call Originated from Network

The FXS application module receives an A bit = 1 and the B bit is ignored from the network. The change of state of the A bit causes the FXS application module to do the following.

- Set the B Transmit signalling bit to a 1 for approximately 200 ms and then returns it to a 0.
- Send ring voltage with ring cadence toward the CPE.
- Send ring back tone towards the network, coincident with the ring cycle.

CPE Answer

The CPE terminates the loop towards the FXS. The FXS ring trips on loop detect, depending on the ring cycle. The FXS transmits A and B bit = 0 towards the network, terminates the ring back tone and opens the audio path.

CPE Disconnect

The CPE removes termination from the loop. The FXS transmits both A and B signalling bits = 0 toward the network. The network responds and the FXS receives an A bit = 0 and ignores the B bit. The FXS opens the tip toward the CPE and returns to the *idle* state.

Network Disconnect

From the network, the FXS receives an A signalling bit = 0 and ignores the B bit. The FXS opens the tip toward the CPE and transmits both A and B signalling bits = 0. The CPE responds to the open tip from the FXS by removing Loop Termination.

Call Originated from CPE

The CPE grounds the ring lead to the FXS application module. The FXS application module transmits both A and B bits = 1 toward the network. After 100 ms, the FXS then grounds the tip. The CPE terminates the tip to ring and removes ring ground. The FXS audio path is active.

PLAR

Private Line Auto Ring

The PLAR is used in pairs on opposite ends of network. The FXS application module transmits only two signalling states toward the network:

- Loop open from the CPE to the FXS application module, A and B signalling bits equal 1,
- Loop closed from the CPE to the FXS application module, A and B signalling bits equal 0 and opens the audio path.

The FXS application module responds only to the received A signalling bit and the B signalling bit is ignored. The FXS application module applies two seconds ON and four seconds OFF ringing to the CPE and ring back tone two seconds ON and four seconds OFF toward the network (only when the loop from the CPE is open and the receive A signalling bit changes from a 1 to a 0).

UVG

UVG must use a Verilink FXO with the FXS in UVG mode. In UVG mode, the FXO/FXS application modules automatically detect if they are in a loop start or ground start circuit and operate appropriately.

UVG with Reverse Battery

UVG with reverse battery must use a Verilink FXO with the FXS in UVG mode. In UVG mode, the FXO and FXS application modules automatically detect if they are in a loop start or ground start circuit and operate appropriately. With reverse battery enabled, a battery reversal from the CO is passed to the CPE.

DID/DNIS

In DID and DNIS operation, an FXO application module in DPT mode is connected to the CPE equipment. The CPE equipment must be capable of supplying loop current to the FXO application module. An FXS application module in DPO mode is connected to the CO and supplies loop current to the CO. Both DID and DNIS are inbound-only services (from the CO to the CPE).

Idle State

The FXS application module provides ground to tip and –48V to ring towards the CO. The FXS transmits A and B signalling bits = 0 towards the network, receives an A bit = 0, and ignores the B bit.

Call Originated from CO

The CO seizes the line by closing tip to ring. The FXS recognizes the loop closure and transmits A and B signalling bits = 1.

CPE Answer

The CPE recognizes the seizure and responds with a wink. During the wink, the FXS receives an A bit = 1 and ignores the B bit. While the A bit = 1, the FXS outputs a battery reversal to tip and ring.

Digit Transmit

After the wink, the CO passes digits to the CPE as DTMF tones or as pulses. DTMF tones are passed as voice frequency data to the CPE. Dial pulses are passed to the CPE by sending both A and B signalling bits = 0 during the break interval and by sending both A and B signalling bits = 1 during the make interval.

CO Terminate

The CO terminates the call by opening the loop. The FXS transmits both A and B signalling bits = 0.

Loop Start DNIS with Wink

In Loop Start DNIS operation, an FXS application module in LS-DNIS mode is connected to the CPE equipment. Another FXS application module in DPO mode is connected to the CO and supplies loop current to the CO. The DNIS service is inbound only (from the CO to the CPE). Outbound calls are handled as MEGACOM or MEGACOM with Reverse Battery.

Idle State

The FXS application module provides ground to tip and −48V to ring towards the CPE. The FXS transmits A and B signalling bits = 0 towards the CO, receives an A bit = 0, and ignores the B bit.

Call Originated From CO

When the CO seizes the line, the FXS receives an A bit = 1 and ignores the B bit. The FXS application module generates a ring signal to the CPE with a cadence of 2 seconds ringing and 4 seconds non-ringing until the CO terminates the call or the CPE answers.

CPE Answer

The CPE answers the ring by looping tip to ring. The FXS generates a wink transmitting A and B signalling bits = 1 towards the CO for 250 milliseconds.

Digit Transmit

After the wink, the CO passes digits to the CPE as DTMF tones. The FXS sends both A and B signalling bits = 0 during this time. The digit transmit time can be set from 1 to 5 seconds.

Connect

While connected, the FXS transmits A and B signalling bits = 1 towards the CO, receives an A bit = 1, and ignores the B bit.

CPE Terminate

The CPE terminates the call by opening the loop from tip to ring. The FXS transmits A and B signalling bits = 0 towards the CO.

CO Terminate

The CO terminates the call by transmitting the A signalling bit = 0 for 500 milliseconds or greater. After the 500 ms, the FXS transmits A and B signalling bits = 0 towards the CO, opens tip for 500 milliseconds, and then restores tip to ground.

Ground Start DNIS with Wink

In Ground Start DNIS operation, an FXS application module in GS-DNIS mode is connected to the CPE equipment. Another FXS application module in DPO mode is connected to the CO and supplies loop current to the CO. The DNIS service is inbound only (from the CO to the CPE). Outbound calls are handled as MEGACOM or MEGACOM with Reverse Battery.

Idle State

The FXS application module opens tip and provides −48V to ring towards the CPE. The FXS transmits A and B signalling bits = 0 towards the CO, receives an A bit = 0, and ignores the B bit.

Call Originated from CO

When the CO seizes the line, the FXS receives an A bit = 1 and ignores the B bit. The FXS application module then provides ground to tip and generates a ring signal to the CPE with a cadence of 2 seconds ringing and 4 seconds non-ringing until the CO terminates the call or the CPE answers.

CPE Answer

The CPE answers the ring by looping tip to ring. The FXS generates a wink transmitting A and B signalling bits = 1 towards the CO for 250 milliseconds.

Digit Transmit After the wink, the CO passes digits to the CPE as DTMF tones. The FXS sends both A and B signalling bits = 0 during this time. The digit transmit time is can be set from 1 to 5 seconds.

Connect While connected, the FXS transmits A and B signalling bits = 1 towards the CO, receives an A bit = 1, and ignores the B bit.

CPE Terminate The CPE terminates the call by opening the loop from tip to ring. The FXS transmits A and B signalling bits = 0 towards the CO. The FXS opens tip.

CO Terminate The CO terminates the call by transmitting the A signalling bit = 0 for 500 milliseconds or greater. After the 500 ms, the FXS transmits A and B signalling bits = 0 towards the CO and opens tip.

Loop Start DNIS with Delay

In Loop Start DNIS operation, an FXS application module in LS-DNIS mode is connected to the CPE equipment. Another FXS application module in DPO mode is connected to the CO and supplies loop current to the CO. The DNIS service is inbound only (from the CO to the CPE). Outbound calls are handled as MEGACOM or MEGACOM with Reverse Battery.

Idle State The FXS application module provides ground to tip and −48V to ring towards the CPE. The FXS transmits A and B signalling bits = 0 towards the CO, receives an A bit = 0, and ignores the B bit.

Call Originated from CO When the CO seizes the line, the FXS receives an A bit = 1 and ignores the B bit. The FXS application module delays for 90 milliseconds. Then the FXS transmits A and B signalling bits = 1 towards the CO and generates a ring signal to the CPE with a cadence of 2 seconds ringing and 4 seconds non-ringing until the CO terminates the call or the CPE answers.

CPE Answer The CPE answers the ring by looping tip to ring.

Digit Transmit After the CPE answers, the FXS transmits A and B signalling bits = 0 towards the CO. The CO then passes digits to the CPE as DTMF tones. The digit transmit time can be set from 1 to 5 seconds.

Connect While connected, the FXS transmits A and B signalling bits = 1 towards the CO; receives an A bit = 1 and ignores the B bit.

CPE Terminate The CPE terminates the call by opening the loop from tip to ring. The FXS transmits A and B signalling bits = 0 towards the CO.

CO Terminate The CO terminates the call by transmitting the A signalling bit = 0 for 500 milliseconds or greater. After the 500 ms, the FXS transmits A and B signalling bits = 0 towards the CO, opens tip for 500 milliseconds, and then restores tip to ground.

Ground Start DNIS with Delay

In Ground Start DNIS operation, an FXS application module in GS-DNIS mode is connected to the CPE equipment. Another FXS application module in DPO mode is connected to the CO and supplies loop current to the CO. The DNIS service is inbound only (from the CO to the CPE). Outbound calls are handled as MEGACOM or MEGACOM with Reverse Battery.

Idle State

The FXS application module opens tip and provides −48V to ring towards the CPE. The FXS transmits A and B signalling bits = 0 towards the CO, receives an A bit = 0, and ignores the B bit.

Call Originated from CO

When the CO seizes the line, the FXS receives an A bit = 1 and ignores the B bit. The FXS application module provides ground to tip, then delays for 90 milliseconds. Then the FXS transmits A and B signalling bits = 1 towards the CO and generates a ring signal to the CPE with a cadence of 2 seconds ringing and 4 seconds non-ringing until the CO terminates the call or the CPE answers.

CPE Answer

The CPE answers the ring by looping tip to ring.

Digit Transmit

After the CPE answers, the FXS transmits A and B signalling bits = 0 towards the CO. The CO then passes digits to the CPE as DTMF tones. The digit transmit time can be set from 1 to 5 seconds.

Connect

While connected, the FXS transmits A and B signalling bits = 1 towards the CO, receives an A bit = 1, and ignores the B bit.

CPE Terminate

The CPE terminates the call by opening the loop from tip to ring. The FXS transmits A and B signalling bits = 0 towards the CO. The FXS opens tip.

CO Terminate

The CO terminates the call by transmitting the A signalling bit = 0 for 500 milliseconds or greater. After the 500 ms, the FXS transmits A and B signalling bits = 0 towards the CO and opens tip.

C MANAGEMENT INFORMATION BASE (MIB) REFERENCE

Introduction

The Verilink 3030 has an optional Ethernet/Token Ring card which provides connectivity for LAN-based management stations. The embedded TCP/IP Protocol Stack allows remote access from both private networks and the Internet.

The Telnet agent provides remote VT100-terminal-emulation capability to access the PRISM 3030 user interface for configuration and control.

Management and monitoring of the unit is provided by an embedded SNMP agent conforming to RFC 1213 (for MIB-II) and RFC 1406 (for DS1).

This appendix describes in detail how the embedded SNMP agent conforms to the RFCs.

Interface Numbering

The interfaces for the 3030 are indexed in the following order: Ethernet or Token Ring, T1 NET, T1 DTE, slots 2 through 6 for data, and slots 2 through 6 for voice. For example, a 3030 with an Ethernet card in Slot 1, a 2-Wire FXS in Slot 2 and a Dual V.35 in Slot 3 is indexed as follows.

1 Ethernet
2 T1 NET
3 V.35 Data Port 3A
4 V.35 Data Port 3B
5 2-Wire FXS Port 2A
6 2-Wire FXS Port 2B
7 2-Wire FXS Port 2C
8 2-Wire FXS Port 2D
9 2-Wire FXS Port 2E
10 2-Wire FXS Port 2F

TXPORT and DDS MIBs

Generic MIB Loading Instructions

The MIBs were written using the standard ASN.1 notation. Any standard SNMP manager should be able to compile the MIBs. Although the exact procedure for loading MIBs may vary from one platform to another, the following basic steps are the same.

1. The SNMP manager has a directory for MIBs. Copy the files DDS.MIB and TXPORT.MIB into this directory. The MIBs are sent out on a DOS-formatted diskette, therefore, a DOS2UNIX command may have to be used for UNIX workstations (typical directories are snmp_mibs for OpenView®, bin for SunNet™ Manager, and mibfiles for Castle Rock SNMPc™).

2. Start the SNMP manager if it is not already running. Select one of the menu selections (or selection subheadings) that contains the SNMP MIB operations (this is Options subheading for HP OpenView and Config subheading for SNMPc).

3. Choose the option for LOADING or COMPILING MIBs. You must specify which MIBs to load.

4. Once the manager has successfully loaded the MIBs, you are ready to manage the Verilink products. If you have any questions please call Verilink Product Support.

The 3030 conforms to RFC 1213 (for MIB-II) and RFC 1406 (for DS1).

This appendix describes in detail how the 3030 embedded SNMP agent conforms to the RFCs and enterpriseSpecific MIBs.

RFC 1213

RFC 1213 defines the objects in the system and interface tables of the MIB-II specification. The remaining sections of MIB-II are supported but not specified here.

system OID { 1.3.6.1.2.1.1 }

Table C-1

Object Name	Object ID	User Access	Object Description	Get	Set
sysDescr	{ system 1 }	read-only	"A textual description of the entity. This value should include the full name and version identification of the system's hardware type, software operating-system, and networking software. It is mandatory that this only contain printable ASCII characters."	Returns the string for the accessed device: TXPORT 3030 w/SNMP Agent	
sysObjectID	{ system 2 }	read-only	"The vendor's authoritative identification of the network management subsystem contained in the entity. This value is allocated within the SMI enterprises subtree (1.3.6.1.4.1) and provides an easy and unambiguous means for determining 'what kind of box' is being managed. For example, if vendor 'Flintstones, Inc.' was assigned the subtree 1.3.6.1.4.1.4242, it could assign the identifier 1.3.6.1.4.1.4242.1.1 to its 'Fred Router'."	Returns the Object Identifier for the accessed device. 1.3.6.1.4.1.425.2.3 (t1CsuDsu)	
sysUpTime	{ system 3 }	read-only	"The time (in hundredths of a second) since the network management portion of the system was last re-initialized."	Returns the time in hundredths of a second since the network interface was reset.	
sysContact	{ system 4 }	read-write	"The textual identification of the contact person for this managed node, together with information on how to contact this person."	Returns the System Contact string for the accessed unit, defaults to "no system contact."	Sets the System Contact string for the accessed unit
sysName	{ system 5 }	read-write	"An administratively-assigned name for this managed node. By convention, this is the node's fully-qualified domain name."	Returns the System Name string for the accessed unit, defaults to "no system name".	Sets the System Name string for the accessed unit.
sysLocation	{ system 6 }	read-write	"The physical location of this node (e.g., 'telephone closet, 3rd floor')."	Returns the System Location string for the accessed unit, defaults to "no system location."	Sets the System Location string for the accessed unit.

Table C-1

Object Name	Object ID	User Access	Object Description	Get	Set
sysServices	{ system 7 }	read-only	"A value which indicates the set of services that this entity primarily offers. The value is a sum. This sum initially takes the value zero, Then, for each layer, L, in the range 1 through 7, that this node performs transactions for, 2 raised to (L – 1) is added to the sum. For example, a node which performs primarily routing functions would have a value of 4 (2^{3-1}). In contrast, a node which is a host offering application services would have a value of 72 (2^{4-1}+ 2^{7-1}). Note that in the context of the Internet suite of protocols, values should be calculated accordingly: layer functionality 1 physical (e.g., repeaters) 2 datalink/subnetwork (e.g., bridges) 3 internet (e.g., IP gateways) 4 end-to-end (e.g., IP hosts) 7 applications (e.g., mail relays) For systems including OSI protocols, layers 5 and 6 may also be counted."	Returns a value of "72" which represents a host offering application services.	

ifTable OID
{ 1.3.6.1.2.1.2 }

Table C-2

Object Name	Object ID	User Access	Object Description	Get	Set
ifNumber	{ interfaces 1 }	read-only	"The number of network interfaces (regardless of their current state) present on this system."	Returns the number of interfaces present on the accessed unit.	
ifIndex	{ ifEntry 1 }	read-only	"A unique value for each interface. Its value ranges between 1 and the value of ifNumber. The value for each interface must remain constant at least from one re-initialization of the entity's network management system to the next re-initialization."	Returns the indexed values of the unit's interfaces. Refer to Introduction on page 95 for instructions on how interfaces may be accessed.	
ifDescr	{ ifEntry 2 }	read-only	"A textual string containing information about the interface. This string should include the name of the manufacturer, the product name and the version of the hardware interface."	Returns one of the following textual descriptions: Ethernet - returned for the E/TR, for Ethernet interface. Token Ring - returned for the E/TR, for Token Ring. T1 Network Interface - returned for the DS1 interface. V.35 Data Port *xy* - returned for slot *x*, port *y* (if a V.35 interface). 530 Data Port *xy* - returned for slot *x*, port *y* (if an EIA-530 interface). RS232 Data Port *xy* - returned for slot *x*, port *y* (if an RS-232 interface). DSX Data Port *xy* - returned for slot *x*, port *y* (if a DSX Data Port) 2Wire FXS Port *xy* - returned for slot *x*, port *y* (if a 2-Wire FXS interface). 2Wire FX0 Port *xy* - returned for slot *x*, port *y* (if a 2-Wire FX0 interface). 4Wire E&M Port *xy* - returned for slot *x*, port *y* (if a 4-Wire E&M interface). DSU Data Port *x-yz* - *x* for slot, *y* for DSU, *z* for port (if a DSU MP interface). T1 D/I Port - returned for the T1 DTE interface on DSUs.	
ifType	{ ifEntry 3 }	read-only	"The type of interface, distinguished according to the physical/link protocol(s) immediately 'below' the network layer in the protocol stack."	Returns one of the following integer values: other (1) - returned for voice interfaces. ethernet-csmacd(6) - returned for Ethernet. iso88025-tokenRing(9) - returned for Token Ring. ds1(18) - returned for the T1 Network and DTE interface. propPointToPointSerial(22) - returned for V.25, EIA-530, and RS-232 data ports.	

Table C-2

Object Name	Object ID	User Access	Object Description	Get	Set
ifMtu	{ ifEntry 4 }	read-only	"The size of the largest datagram which can be sent/received on the interface, specified in octets. For interfaces that are used for transmitting network datagrams, this is the size of the largest network datagram that can be sent on the interface."	Returns one of the following integer values: 1500 - returned for the Ethernet interface. 2000 - returned for the Token Ring. 0 - returned for all other interfaces.	
ifSpeed	{ ifEntry 5 }	read-only	"An estimate of the interface's current bandwidth in bits per second. For interfaces which do not vary in bandwidth or for those where no accurate estimation can be made, this object should contain the nominal bandwidth."	Returns the rate at which the interface is running.	
ifPhysAddress	{ ifEntry 6 }	read-only	"The interface's address at the protocol layer immediately 'below' the network layer in the protocol stack. For interfaces which do not have such an address (e.g., a serial line), this should contain an octet string of zero length."	Returns an octet string of zero length for all interfaces except the E/TR Ethernet/TokenRing interface, which returns the physical address of the unit.	
ifAdminStatus	{ ifEntry 7 }	read-write	"The desired state of the interface. The testing(3) state indicates that no operational packets can be passed."	Returns user selected value. Defaults to up(1).	up(1) - user sets to signify the interface is active, and does not have a testing status. down(2) - user sets to signify the interface is not enabled or in an alarm condition. testing(3) - user sets to signify the interface has a test loop or BERT active.
ifOperStatus	{ ifEntry 8 }	read-only	"The current operational state of the interface. The testing(3) state indicates that no operational packets can be passed."	up(1) - returned if the interface is active, and does not have a testing status. down(2) - returned if the interface is not enabled or in an alarm condition. testing(3) - returned if the interface has a test loop or BERT active.	

Table C-2

Object Name	Object ID	User Access	Object Description	Get	Set
ifLastChange	{ ifEntry 9 }	read-only	"The value of sysUpTime at the time the interface entered its current operational state. If the current state was entered prior to the last re-initialization of the local network management subsystem, then this object contains a zero value."	Returns the time in hundredths of a second when the interface was changed or reset.	
ifSpecific	{ ifEntry 22 }	read-only	"A reference to MIB definitions specific to the particular media being used to realize the interface. For example, if the interface is realized by an ethernet, then the value of this object refers to a document defining objects specific to ethernet. If thisinformation is not present, its value should be set to the OBJECT IDENTIFIER { 0 0 }, which is a syntatically valid object identifier, and any conformant implementation of ASN.1 and BER must be able to generate and recognize this value.	T1 Network Interface { 1.3.6.1.2.1.10.18 } (ds1) All others { 0.0 }	

RFC 1406 - DS1/E1 MIB

This RFC was published in January 1993 and supersedes RFC 1232. RFC 1406 is used to manage DS1 interfaces, and in this case, a T1 interface. The following lists the objects contained within this RFC and how the unit responds to them.

dsx1ConfigTable OID { 1.3.6.1.2.1.10.18.6 }

Table C-3

Object Name	Object ID	User Access	Object Description	Get	Set
dsx1LineIndex	{ dsx1Config Entry 1 }	read-only	"This object is the identifier of a DS1 Interface on a managed device. If there is an ifEntry that is directly associated with this and only this DS1 interface, it should have the same value as ifIndex. Otherwise, the value exceeds ifNumber, and is a unique identifier following this rule: inside interfaces (e.g., equipment side) with even numbers and outside interfaces (e.g., network side) with odd numbers."	Returns the ifIndex of the specified DS1 interface.	
dsx1IfIndex	{ dsx1Config Entry 2 }	read-only	"This value for this object is equal to the value of ifIndex from the Interfaces table of MIB II (RFC 1213)."	Returns the ifIndex of the specified DS1 interface.	

Table C-3

Object Name	Object ID	User Access	Object Description	Get	Set
dsx1LineType	{ dsx1Config Entry 5 }	read-write	"This variable indicates the variety of DS1 Line implementing this circuit. The type of circuit affects the number of bits per second that the circuit can reasonably carry, as well as the interpretation of the usage and error statistics. The values, in sequence, describe: dsx1ESF Extended SuperFrame DS1 dsx1D4 AT&T D4 format DS1 dsx1E1 CCITT Recommendation G.704 (Table 4a) dsx1E1-CRC CCITT Recommendation G.704 (Table 4b) dsxE1-MF G.704 (Table 4a) with TS16 multiframing enabled dsx1E1-CRC-MF G.704 (Table 4b) with TS16 multiframing enabled"	dsx1ESF(2) - the Network Framing is set to ESF. dsx1D4(3) - the Network Framing is set to D4.	dsx1ESF(2) - the Network Framing is set to ESF. dsx1D4(3) - the Network Framing is set to D4.

Table C-3

Object Name	Object ID	User Access	Object Description	Get	Set
dsx1LineCoding	{ dsx1Config Entry 6 }	read-write	"This variable describes the variety of Zero Code Suppression used on the link, which in turn affects a number of its characteristics. dsx1JBZS refers the Jammed Bit Zero Suppression, in which the AT&T specification of at least one pulse every 8 bit periods is literally implemented by forcing a pulse in bit 8 of each channel. Thus, only seven bits per channel, or 1.344 Mbps, is available for data. dsx1B8ZS refers to the use of a specified pattern of normal bits and bipolar violations which are used to replace a sequence of eight zero bits. ANSI Clear Channels may use dsx1ZBTSI, or Zero Byte Time Slot Interchange. E1 links, with or without CRC, use dsx1HDB3 or dsx1AMI. dsx1AMI refers to a mode wherein no zero code suppression is present and the line encoding does not solve the problem directly. In this application, the higher layer must provide data which meets or exceeds the pulse density requirements, such as inverting HDLC data."	dsx1B8ZS(2) - the Network Coding is set to B8ZS. dsx1AMI(5) - the Network Coding is set to AMI.	dsx1B8ZS(2) - the Network Coding is set to B8ZS. dsx1AMI(5) - the Network Coding is set to AMI.

Table C-3

Object Name	Object ID	User Access	Object Description	Get	Set
dsx1SendCode	{ dsx1Config Entry 7 }	read-write	"This variable indicates what type of code is being sent across the DS1 interface by the device. The values mean: dsx1SendNoCode sending looped or normal data dsx1SendLineCode sending a request for a line loopback dsx1SendPayloadCode sending a request for a payload loopback dsx1SendResetCode sending a loopback termination request dsx1SendQRS sending a Quasi-Random Signal (QRS) test pattern dsx1Send511Pattern sending a 511 bit fixed test pattern dsx1Send3in24Pattern sending a fixed test pattern of 3 bits set in 24 dsx1SendOtherTest Pattern sending a test pattern other than those described by this object."	dsx1SendNoCode(1) - the unit is not in a BERT Test and not sending a PLB or LLB loopup/loopdown request to the far end. dsx1SendLineCode(2) - the unit is transmitting an in-band LLB loopup signal. Since this occurs so quickly, this response probably will not be seen. dsx1SendPayload Code(3) - the unit is sending an out-of-band PLB loopup request to the far end, but since this occurs so quickly, this response probably will not be seen. dsx1SendResetCode(4) - the unit is sending either an in-band LLB loopdown signal, or an out-of-band PLB loopdown request, but since these occur so quickly, this response probably will not be seen. dsx1SendQRS(5) - the unit is in a Network BERT transmitting QRSS pattern. dsx1Send511Pattern(6) - the unit is in a Network BERT transmitting 511 pattern. dsx1Send3in24Pattern(7) - the unit is in a Network BERT transmitting 3:24 pattern. dsx1SendOtherTest Pattern(8) - the unit is in a Network BERT and is transmitting a pattern other than QRSS, 511, or 3:24.	dsx1SendNoCode(1) - disable near-end BERT tests. dsx1SendLineCode(2) - the unit will transmit an in-band LLB loopup signal. dsx1SendPayload Code(3) - the unit will send an out-of-band PLB loopup request to the far end. dsx1SendResetCode(4) - the unit will send either an in-band LLB loopdown signal, or an out-of-band PLB loopdown request. dsx1SendQRS(5) - the unit will initiate a Network BERT transmitting QRSS pattern. dsx1Send511Pattern(6) - the unit will initiate a Network BERT transmitting 511 pattern. dsx1Send3in24 Pattern(7) - the unit will initiate a Network BERT transmitting 3:24 pattern. dsx1SendOtherTest Pattern(8) - the unit will initiate a BERT and is transmitting a pattern other than QRSS, 511, or 3:24.
dsx1Circuit Identifier	{ dsx1Config Entry 8 }	read-write	"This variable contains the transmission vendor's circuit identifier, for the purpose of facilitating troubleshooting."	Returns the value of the Circuit Identifier for the unit, this defaults to "TxPORT PRISM 3030."	Sets the value of the Circuit Identifier for the unit.

Table C-3

Object Name	Object ID	User Access	Object Description	Get	Set
dsx1Loopback Config	{ dsx1Config Entry 9 }	read-write	"This variable represents the loopback configuration of the DS1 interface. Agents supporting read/write access should return badValue in response to a requested loopback state that the interface does not support. The values mean: dsx1NoLoop Not in the loopback state. A device that is not capable of performing a loopback on the interface shall always return this as it's value. dsx1PayloadLoop The received signal at this interface is looped through the device. Typically the received signal is looped back for retransmission after it has passed through the device's framing function. dsx1LineLoop The received signal at this interface does not go through the device (minimum penetration) but is looped back out. dsx1OtherLoop Loopbacks that are not defined here."	dsx1NoLoop(1) - the unit does not have any loops active. dsx1PayloadLoop(2) - the unit has a NET PLB active. dsx1LineLoop(3) - the unit has a NET LLB active. dsx1OtherLoop(4) - the unit has a Port Loop active.	dsx1NoLoop(1) - the unit will take down any active loops. dsx1PayloadLoop(2) - the unit will initiate a NET PLB. dsx1LineLoop(3) - the unit will initiate a NET LLB. dsx1OtherLoop(4) - the unit will initiate a Port Loop on the first port.

Table C-3

Object Name	Object ID	User Access	Object Description	Get	Set
dx1LineStatus	{ dsx1Config Entry 10 }	read-only	"This variable indicates the Line Status of the interface. It contains loopback, failure, received 'alarm' and transmitted 'alarm' information. The dsx1LineStatus is a bit map represented as a sum, therefore, it can represent multiple failures (alarms) and a LoopbackState simultaneously. dsx1NoAlarm should be set if and only if no other flag is set. If the dsx1LoopbackState bit is set, the loopback in effect can be determined from the dsx1LoopbackConfig object. The various bit positions are: 1 dsx1NoAlarm No Alarm Present 2 dsx1RcvFarEndLOF Far end LOF (a.k.a., Yellow Alarm) 4 dsx1XmtFarEndLOF Near end sending LOF Indication 8 dsx1RcvAIS Far end sending AIS 16 dsx1XmtAIS Near end sending AIS 32 dsx1LossOfFrame Near end LOF (a.k.a., Red Alarm) 64 dsx1LossOfSignal Near end Loss Of Signal 128 dsx1LoopbackState Near end is looped 256 dsx1T16AIS E1 TS16 AIS 512 dsx1RcvFarEndLOMF Far End Sending TS16 LOMF 1024 dsx1XmtFarEndLOMF Near End Sending TS16 LOMF 2048 dsx1RcvTestCode Near End detects a test code 4096 dsx1OtherFailure any line status not defined here"	Returns a sum of the following dsx1NoAlarm(1) - the unit has no alarms. dsx1RcvFarEndLOF(2) - the unit is receiving a yellow alarm from the far end. dsx1XmtFarEndLOF(4) - unit is transmitting a yellow alarm. dsx1RcvAIS(8) - the unit is receiving AIS from the far end. dsx1XmtAIS(16) - not applicable. dsx1LossOfFrame(32) - unit is currently in an OOF condition. dsx1LossOfSignal(64) - the unit is currently in a LOS condition. dsx1LoopbackState(128) - the unit has a loop active dsx1T16AIS(256) - not applicable. dsx1RcvFarEndLOMF (512) - not applicable. dsx1XmtFarEndLOMF (1024) - not applicable. dsx1RcvTestCode(2048) - not applicable. dsx1OtherFailure(4096) - not applicable.	

Table C-3

Object Name	Object ID	User Access	Object Description	Get	Set
dsx1Signal Mode	{ dsx1Config Entry 11 }	read-write	"'none' indicates that no bits are reserved for signalling on this channel. 'robbedBit' indicates that T1 Robbed Bit Signalling is in use. 'bitOriented' indicates that E1 Channel Associated Signalling is in use. 'messageOriented' indicates that Common Channel Signalling is in use either on channel 16 of an E1 link or channel 24 of a T1."	none(1) - this signal mode is the only mode supported.	No action, this parameter may not be changed.
dsx1Transmit ClockSource	{ dsx1Config Entry 12 }	read-write	"The source of Tranmit Clock. 'loopTiming' indicates that the recovered receive clock is used as the transmit clock. 'localTiming' indicates that a local clock source is used. 'throughTiming' indicates that recovered receive clock from another interface is used as the transmit clock."	loopTiming(1) - the Network Timing is set to Network Clock. localTiming(2) - the Network Timing is set to Internal Clock. throughTiming(3) - the Network Timing is set to some other source than Network or Interval.	loopTiming(1) - the Network Timing is set to Network Clock. localTiming(2) - the Network Timing is set to Internal Clock. throughTiming(3) - the Network Timing is set to Port 2A Timing.
dsx1Fdl	{ dsx1Config Entry 13 }	read-write	"This bitmap describes the use of the facilities data link, and is the sum of the capabilities: 'other' indicates that a protocol other than one following is used. 'dsx1Ansi-T1-403' refers to the FDL exchange recommended by ANSI. 'dsx1Att-54016' refers to ESF FDL exchanges. 'dsx1Fdl-none' indicates that the device does not use the FDL."	Returns a sum of the following other(1) - Rem Comm Channel is active. dsx1Ansi-T1-403(2) - the Network Framing is ESF, and PRM Enable is Enabled. dsx1Att-54016(4) - the Network Framing is ESF or Rem Comm Channel is active, therefore TR 54016 messaging is active. dsx1Fdl-none(8) - the Network Framing is D4, and there is no active Rem Comm Channel.	No action, this parameter may not be changed.

dsx1CurrentTable OID { 1.3.6.1.2.1.10.18.7 }

Table C-4

Object Name	Object ID	User Access	Object Description	Get
dsx1CurrentIndex	{ dsx1CurrentEntry 1 }	read-only	"The index value which uniquely identifies the DS1 interface to which this entry is applicable. The interface identified by a particular value of this index is the same interface as identified by the same value as a dsx1LineIndex object instance."	Returns the ifIndex of the specified DS1 interface.
dsx1CurrentESs	{ dsx1CurrentEntry 3 }	read-only	"The number of Severely Errored Seconds encountered by a DS1 interface in the current 15 minute interval."	Returns the number of Errored Seconds (per TR 54016) in the current 15-minute interval.
dsx1CurrentSESs	{ dsx1CurrentEntry 3 }	read-only	"The number of Severely Errored Seconds encountered by a DS1 interface in the currnet 15 minute interval."	Returns the number of Severely Errored Seconds (per TR 54016) in the current 15-minute interval.
dsx1CurrentSEFSs	{ dsx1CurrentEntry 4 }	read-only	"The number of Severely Errored Framing Seconds encountered by a DS1 interface in the current 15 minute interval."	Returns the number of Loss Of Frame Seconds (per TR 54016) in the current 15-minute interval.
dsx1CurrentUASs	{ dsx1CurrentEntry 5 }	read-only	"The number of Unavailable Seconds encountered by a DS1 interface in the current 15 minute interval."	Returns the number of Unavailable Seconds (per TR 54016) in the current 15-minute interval.
dsx1CurrentCSSs	{ dsx1CurrentEntry 6 }	read-only	"The number of Controlled Slip Seconds encountered by a DS1 interface in the current 15 minute interval."	Returns the number of Controlled Slip Seconds (per TR 54016) in the current 15-minute interval.
dsx1CurrentPCVs	{ dsx1CurrentEntry 7 }	read-only	"The number of Path Coding Violations encountered by a DS1 interface in the current 15 minute interval."	Returns 0.
dsx1CurrentLESs	{ dsx1CurrentEntry 8 }	read-only	"The number of Line Errored Seconds encountered by a DS1 interface in the current 15 minute interval."	Returns the number of Bipolar Violation Seconds (per TR 54016) in the current 15-minute interval.
dsx1CurrentBESs	{dsx1CurrentEntry 9 }	read-only	"The number of Bursty Errored Seconds (BESs) encountered by a DS1 interface in the current 15 minute interval."	Returns the number of Bursty Errored Seconds (per TR 54016) in the current 15-minute interval.
dsx1CurrentDMs	{ dsx1CurrentEntry 10 }	read-only	"The number of Degraded Minutes (DMs) encountered by a DS1 interface in the current 15 minute interval."	Returns 0.
dsx1CurrentLCVs	{dsx1CurrentEntry 11 }	read-only	"The number of Line Code Violations (LCVs) encountered by a DS1 interface in the current 15 minute interval."	Returns 0.

dsx1IntervalTable
OID
{ 1.3.6.1.2.1.10.18.8 }

Table C-5

Object Name	Object ID	User Access	Object Description	Get
dsx1IntervalIndex	{ dsx1IntervalEntry 1 }	read-only	"The index value which uniquely identifies the DS1 interface to which this entry is applicable. The interface identified by a particular value of this index is the same interface as identified by the same value as a dsx1LineIndex object instance."	Returns the ifIndex of the specified DS1 interface.
dsx1IntervalNumber	{ dsx1IntervalEntry 2 }	read-only	"A number between 1 and 96, where 1 is the most recently completed 15 minute interval and 96 is the least recently completed 15 minutes interval (assuming that all 96 intervals are valid)."	Returns the interval number for the interval requested, a number from 1 to 96.
dsx1IntervalESs	{ dsx1IntervalEntry 3 }	read-only	"The number of Errored Seconds encountered by a DS1 interface in one of the previous 96, individual 15 minute, intervals."	Returns the number of Errored Seconds (per TR 54016) in the specified 15-minute interval.
dsx1IntervalSESs	{ dsx1IntervalEntry 4 }	read-only	"The number of Severely Errored Seconds encountered by a DS1 interface in one of the previous 96, individual 15 minute, intervals."	Returns the number of Severely Errored Seconds (per TR 54016) in the specified 15-minute interval.
dsx1IntervalSEFSs	{ dsx1IntervalEntry 5 }	read-only	"The number of Severely Errored Framing Seconds encountered by a DS1 interface in one of the previous 96, individual 15 minute, intervals."	Returns the number of Loss Of Frame Seconds (per TR 54016) in the specified 15-minute interval.
dsx1IntervalUASs	{ dsx1IntervalEntry 6 }	read-only	"The number of Unavailable Seconds encountered by a DS1 interface in one of the previous 96, individual 15 minute, intervals."	Returns the number of Unavailable Seconds (per TR 54016) in the specified 15-minute interval.
dsx1IntervalCSSs	{ dsx1IntervalEntry 7 }	read-only	"The number of Controlled Slip Seconds encountered by a DS1 interface in one of the previous 96, individual 15 minute, intervals."	Returns the number of Controlled Slip Seconds (per TR 54016) in the specified 15-minute interval.
dsx1IntervalPCVs	{ dsx1IntervalEntry 8 }	read-only	"The number of Path Coding Violations encountered by a DS1 interface in one of the previous 96, individual 15 minute, intervals."	Returns 0.
dsx1IntervalLESs	{ dsx1IntervalEntry 9 }	read-only	"The number of Line Errored Seconds encountered by a DS1 interface in one of the previous 96, individual 15 minute, intervals."	Returns the number of Bipolar Violation Seconds (per TR 54016) in the specified 15-minute interval.
dsx1IntervalBESs	{ dsx1IntervalEntry 10 }	read-only	"The number of Bursty Errored Seconds (BESs) encountered by a DS1 interface in one of the previous 96, individual 15 minute, intervals."	Returns the number of Bursty Errored Seconds (per TR 54016) in the specified 15-minute interval.
dsx1IntervalDMs	{ dsx1IntervalEntry 11 }	read-only	"The number of Degraded Minutes (DMs) encountered by a DS1 interface in one of the previous 96, individual 15 minute, intervals."	Returns 0.
dsx1IntervalLCVs	{ dsx1IntervalEntry 12 }	read-only	"The number of Line Code Violations (LCVs) encountered by a DS1 interface in the current 15 minute interval."	Returns 0.

dsx1TotalTable OID
{ 1.3.6.1.2.1.10.18.9 }

Table C-6

Object ID	Object Name	User Access	Object Description	Get
{ dsx1TotalEntry 1 }	dsx1TotalIndex	read-only	"The index value which uniquely identifies the DS1 interface to which this entry is applicable. The interface identified by a particular value of this index is the same interface as identified by the same value as a dsx1LineIndex object instance."	Returns the ifIndex of the specified DS1 interface.
{ dsx1TotalEntry 2 }	dsx1TotalESs	read-only	"The number of Errored Seconds encountered by a DS1 interface in the previous 24 hour interval"	Returns the number of Errored Seconds (per TR 54016) in the previous 24-hour period.
{ dsx1TotalEntry 3}	dsx1TotalSESs	read-only	"The number of Severely Errored Seconds encountered by a DS1 interface in the previous 24 hour interval."	Returns the number of Severely Errored Seconds (per TR 54016) in the previous 24-hour period.
{ dsx1TotalEntry 4 }	dsx1TotalSEFSs	read-only	"The number of Severely Errored Framing Seconds encountered by a DS1 interface in the previous 24 hour interval."	Returns the number of Loss Of Frame Seconds (per TR 54016) in the previous 24-hour period.
{ dsx1TotalEntry 5 }	dsx1TotalUASs	read-only	"The number of Unavailable Seconds encountered by a DS1 interface in the previous 24 hour interval."	Returns the number of Unavailable Seconds (per TR 54016) in the previous 24-hour period.
{ dsx1TotalEntry 6 }	dsx1TotalCSSs	read-only	"The number of Controlled Slip Seconds encountered by a DS1 interface in the previous 24 hour interval."	Returns the number of Controlled Slip Seconds (per TR 54016) in the previous 24-hour period.
{ dsx1TotalEntry 7 }	dsx1TotalPCVs	read-only	"The number of Path Coding Violations encountered by a DS1 interface in the previous 24 hour interval."	Returns 0.
{ dsx1TotalEntry 8 }	dsx1TotalLESs	read-only	"The number of Line Errored Seconds encountered by a DS1 interface in the previous 24 hour interval."	Returns the number of Bipolar Violation Seconds (per TR 54016) in the previous 24-hour period.
{ dsx1TotalEntry 9 }	dsx1TotalBESs	read-only	"The number of Bursty Errored Seconds (BESs) encountered by a DS1 interface in the previous 24 hour interval."	Returns the number of Bursty Errored Seconds (per TR 54016) in the previous 24-hour period.
{ dsx1TotalEntry 10 }	dsx1TotalDMs	read-only	"The number of Degraded Minutes (DMs) encountered by a DS1 interface in the previous 24 hour interval."	Returns 0.
{ dsx1TotalEntry 11 }	dsx1TotalLCVs	read-only	"The number of Line Code Violations (LCVs) encountered by a DS1 interface in the current 15 minute interval."	Returns 0.

dsx1FarEndCurrent Table OID {1.3.6.1.2.1.10.18.10}

Table C-7

Object Name	Object ID	User Access	Object Description	Get
dsx1FarEndCurrentIndex	{ dsx1FarEndCurrentEntry 1 }	read-only	"The index value which uniquely identifies the DS1 interface to which this entry is applicable. The interface identified by a particular value of this index is the same interface as identified by the same value an dsx1LineIndex object instance."	Returns the ifIndex of the specified DS1 interface.
dsx1FarEndTimeElapsed	{ dsx1FarEndCurrentEntry 2 }	read-only	"The number of seconds that have elapsed since the beginning of the far end current error-measurement period."	Returns the number of seconds in the current interval for the far end.
dsx1FarEndValidIntervals	{ dsx1FarEndCurrentEntry 3 }	read-only	"The number of previous far end intervals for which valid data was collected. The value will be 96 unless the interface was brought online within the last 24 hours, in which case the value will be the number of complete 15 minute far end intervals since the interface has been online."	Returns a number from 1 to 96 of completed intervals for the far end.
dsx1FarEndCurrentESs	{ dsx1FarEndCurrentEntry 4 }	read-only	"The number of Far End Errored Seconds encountered by a DS1 interface in the current 15 minute interval."	Returns the number of Errored Seconds (per TR 54016) in the current 15-minute interval for the far end.
dsx1FarEndCurrentSESs	{ dsx1FarEndCurrentEntry 5 }	read-only	"The number of Far End Severely Errored Seconds encountered by a DS1 interface in the current 15 minute interval."	Returns the number of Severely Errored Seconds (per TR 54016) in the current 15-minute interval for the far end.
dsx1FarEndCurrentSEFSs	{ dsx1FarEndCurrentEntry 6 }	read-only	"The number of Far End Severely Errored Framing Seconds encountered by a DS1 interface in the current 15 minute interval."	Returns the number of Loss Of Frame Seconds (per TR 54016) in the current 15-minute interval for the far end.
dsx1FarEndCurrentUASs	{ dsx1FarEndCurrentEntry 7 }	read-only	"The number of Unavailable Seconds encountered by a DS1 interface in the current 15 minute interval."	Returns the number of Unavailable Seconds (per TR 54016) in the current 15-minute interval for the far end.
dsx1FarEndCurrentCSSs	{ dsx1FarEndCurrentEntry 8 }	read-only	"The number of Far End Controlled Slip Seconds encountered by a DS1 interface in the current 15 minute interval."	Returns the number of Controlled Slip Seconds (per TR 54016) in the current 15-minute interval for the far end.

Table C-7

Object Name	Object ID	User Access	Object Description	Get
dsx1FarEndCurrentLESs	{ dsx1FarEndCurrentEntry 9 }	read-only	"The number of Far End Line Errored Seconds encountered by a DS1 interface in the current 15 minute interval."	Returns the number of Bipolar Violation Seconds (per TR 54016) in the current 15-minute interval for the far end.
dsx1FarEndCurrentPCVs	{ dsx1FarEndCurrentEntry 10 }	read-only	"The number of Far End Path Coding Violations reported via the far end block error count encountered by a DS1 interface in the current 15 minute interval."	Returns 0.
dsx1FarEndCurrentBESs	{dsx1FarEndCurrentEntry 11 }	read-only	"The number of Bursty Errored Seconds (BESs) encountered by a DS1 interface in the current 15 minute interval."	Returns the number of Bursty Errored Seconds (per TR 54016) in the current 15-minute interval for the far end.
dsx1CurrentDMs	{ dsx1FarEndCurrentEntry 12 }	read-only	"The number of Degraded Minutes (DMs) encountered by a DS1 interface in the current 15 minute interval."	Returns 0.

dsx1FarEndInterval Table OID {1.3.6.1.2.1.10.18.11}

Table C-8

Object Name	Object ID	User Access	Object Description	Get
dsx1FarEndIntervalIndex	{ dsx1FarEndIntervalEntry 1}	read-only	"The index value which uniquely identifies the DS1 interface to which this entry is applicable. The interface identified by a particular value of this index is the same interface as identified by the same value as a dsx1LineIndex object instance."	Returns the ifIndex of the specified DS1 interface.
dsx1FarEndIntervalNumber	{ dsx1FarEndIntervalEntry 2 }	read-only	"A number between 1 and 96, where 1 is the most recently completed 15 minute interval and 96 is the least recently completed 15 minutes interval (assuming that all 96 intervals are valid)."	Returns the interval number for the interval requested, a number from 1 to 96.
dsx1FarEndIntervalESs	{ dsx1FarEndIntervalEntry 3 }	read-only	"The number of Far End Errored Seconds encountered by a DS1 interface in one of the previous 96, individual 15 minute, intervals."	Returns the number of Errored Seconds (per TR 54016) in the specified 15-minute interval for the far end.
dsx1FarEndIntervalSESs	{ dsx1FarEndIntervalEntry 4 }	read-only	"The number of Far End Severely Errored Seconds encountered by a DS1 interface in one of the previous 96, individual 15 minute, intervals."	Returns the number of Severely Errored Seconds (per TR 54016) in the specified 15-minute interval for the far end.

Table C-8

Object Name	Object ID	User Access	Object Description	Get
dsx1FarEndIntervalSEFSs	{ dsx1FarEndIntervalEntry 5 }	read-only	"The number of Far End Severely Errored Framing Seconds encountered by a DS1 interface in one of the previous 96, individual 15 minute, intervals."	Returns the number of Loss Of Frame Seconds (per TR 54016) in the specified 15-minute interval for the far end.
dsx1FarEndIntervalUASs	{ dsx1FarEndIntervalEntry 6 }	read-only	"The number of Unavailable Seconds encountered by a DS1 interface in one of the previous 96, individual 15 minute, intervals."	Returns the number of Unavailable Seconds (per TR 54016) in the specified 15-minute interval for the far end.
dsx1FarEndIntervalCSSs	{ dsx1FarEndIntervalEntry 7 }	read-only	"The number of Far End Controlled Slip Seconds encountered by a DS1 interface in one of the previous 96, individual 15 minute, intervals."	Returns the number of Controlled Slip Seconds (per TR 54016) in the specified 15-minute interval for the far end.
dsx1FarEndIntervalLESs	{ dsx1FarEndIntervalEntry 8 }	read-only	"The number of Far End Line Errored Seconds encountered by a DS1 interface in one of the previous 96, individual 15 minute, intervals."	Returns the number of Bipolar Violation Seconds (per TR 54016) in the specified 15-minute interval for the far end.
dsx1FarEndIntervalPCVs	{ dsx1FarEndIntervalEntry 9 }	read-only	"The number of Far End Path Coding Violations reported via the far end block error count encountered by a DS1 interface in one of the previous 96, individual 15 minute, intervals."	Returns 0.
dsx1FarEndIntervalBESs	{ dsx1FarEndIntervalEntry 10 }	read-only	"The number of Bursty Errored Seconds (BESs) encountered by a DS1 interface in one of the previous 96, individual 15 minute, intervals."	Returns the number of Bursty Errored Seconds (per TR 54016) in the specified 15-minute interval for the far end.
dsx1FarEndIntervalDMs	{ dsx1FarEndIntervalEntry 11 }	read-only	"The number of Degraded Minutes (DMs) encountered by a DS1 interface in one of the previous 96, individual 15 minute, intervals."	Returns 0.

dsx1FarEndTotal Table OID {1.3.6.1.2.1.10.18.12}

Table C-9

Object Name	Object ID	User Access	Object Description	Get
dsx1FarEndTotalIndex	{ dsx1FarEndTotalEntry 1 }	read-only	"The index value which uniquely identifies the DS1 interface to which this entry is applicable. The interface identified by a particular value of this index is the same interface as identified by the same value an dsx1LineIndex object instance."	Returns the ifIndex of the specified DS1 interface.
dsx1FarEndTotalESs	{ dsx1FarEndTotalEntry 2 }	read-only	"The number of Far End Errored Seconds encountered by a DS1 interface in the previous 24 hour interval."	Returns the number of Errored Seconds (per TR 54016) in the previous 24-hour period for the far end.
dsx1FarEndTotalSESs	{ dsx1FarEndTotalEntry 3 }	read-only	"The number of Far End Severely Errored Seconds encountered by a DS1 interface in the previous 24 hour interval."	Returns the number of Severely Errored Seconds (per TR 54016) in the previous 24-hour period for the far end.
dsx1FarEndTotalSEFSs	{ dsx1FarEndTotalEntry 4 }	read-only	"The number of Far End Severely Errored Framing Seconds encountered by a DS1 interface in the previous 24 hour interval."	Returns the number of Loss Of Frame Seconds (per TR 54016) in the previous 24-hour period for the far end.
dsx1FarEndTotalUASs	{ dsx1FarEndTotalEntry 5 }	read-only	"The number of Unavailable Seconds encountered by a DS1 interface in the previous 24 hour interval."	Returns the number of Unavailable Seconds (per TR 54016) in the previous 24-hour period for the far end.
dsx1FarEndTotalCSSs	{ dsx1FarEndTotalEntry 6 }	read-only	"The number of Far End Controlled Slip Seconds encountered by a DS1 interface in the previous 24 hour interval."	Returns the number of Controlled Slip Seconds (per TR 54016) in the previous 24-hour period for the far end.
dsx1FarEndTotalLESs	{ dsx1FarEndTotalEntry 7 }	read-only	"The number of Far End Line Errored Seconds encountered by a DS1 interface in the previous 24 hour interval."	Returns the number of Bipolar Violation Seconds (per TR 54016) in the previous 24-hour period for the far end.
dsx1FarEndTotalPCVs	{ dsx1FarEndTotalEntry 8 }	read-only	"The number of Far End Path Coding Violations reported via the far end block error count encountered by a DS1 interface in the previous 24 hour interval."	Returns 0.
dsx1FarEndTotalBESs	{ dsx1FarEndTotalEntry 9 }	read-only	"The number of Bursty Errored Seconds (BESs) encountered by a DS1 interface in the previous 24 hour interval."	Returns the number of Bursty Errored Seconds (per TR 54016) in the previous 24-hour period for the far end.
dsx1FarEndTotalDMs	{ dsx1FarEndTotalEntry 10 }	read-only	"The number of Degraded Minutes (DMs) encountered by a DS1 interface in the previous 24 hour interval."	Returns 0.

dsx1FracTable OID {1.3.6.1.2.1.10.18.13}

Table C-10

Object Name	Object ID	User Access	Object Description	Get	Set
dsx1FracIndex	{ dsx1FracEntry 1 }	read-only	"The index value which uniquely identifies the DS1 interface to which this entry is applicable. The interface identified by a particular value of this index is the same interface as identified by the same value an dsx1LineIndex object instance."	(2) - Returns the ifIndex of the DS1 interface.	
dsx1FracNumber	{ dsx1FracEntry 2 }	read-only	"The channel number for this entry."	Returns the channel number (1 to 24).	
dsx1FracIfIndex	{ dsx1FracEntry 3 }	read-write	"An index value that uniquely identifies an interface. The interface identified by a particular value of this index is the same interface as identified by the same value an ifIndex object instance. If no interface is currently using a channel, the value should be zero. If a single interface occupies more than one time slot, that ifIndex value will be found in multiple time slots."	Returns the number of the interface to which the specified channel is assigned.	Can assign the channel to an interface. NOTE: Please be very careful when using this function.

Definition of Traps

Verilink products with SNMP support provide for the detection and reporting of network alarms. When an alarm occurs, the SNMP agent sends a trap message (formatted per RFC 1157) to multiple destinations on the user's network. The generic trap type is enterpriseSpecific (generic-trap = 7).

Network problems often cause more than one alarm type. In this case, multiple trap messages are generated, each with a different specific-trap type.

Some alarm types do not apply to certain products.

The Trap-PDU has six mandatory fields as shown in the lower level of Figure C-1.

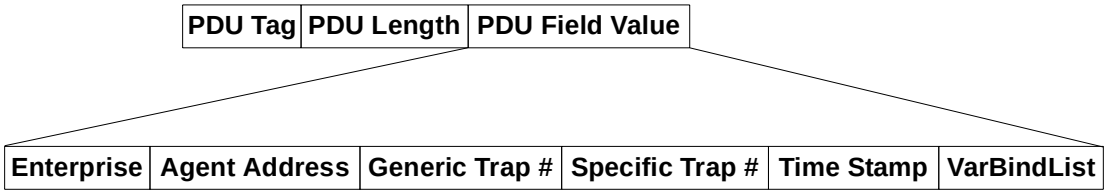


Figure C-1 Trap-PDU Format

The Enterprise field is composed of the Object Identifier of the MIB branch containing the trap definitions. Returns { 1.3.6.1.4.1.425.4 } { txport traps }.

The Agent Address Field is the agent's IP address unit. This further identifies the trap sender to the NMS receiving the trap.

The Generic Trap field contains an integer value that represents one of the standard predefined traps for SNMP.

The Specific Trap field contains trap values defined for a particular enterprise. The values in this field are defined in the txport.mib and the following tables. The list is broken down in specific sections to group trap definitions by use.

The Time Stamp field contains the time the trap was generated in the form of time ticks that have elapsed since the agent was initialized. The value is in units of hundredths of a second. ifIndex is typically provided in the Variable Binding List.

The Variable Bindings List contains supplemental implementation information when included in the Trap-PDU.

enterprise Specific Traps

Interface Traps (T1 DTE)

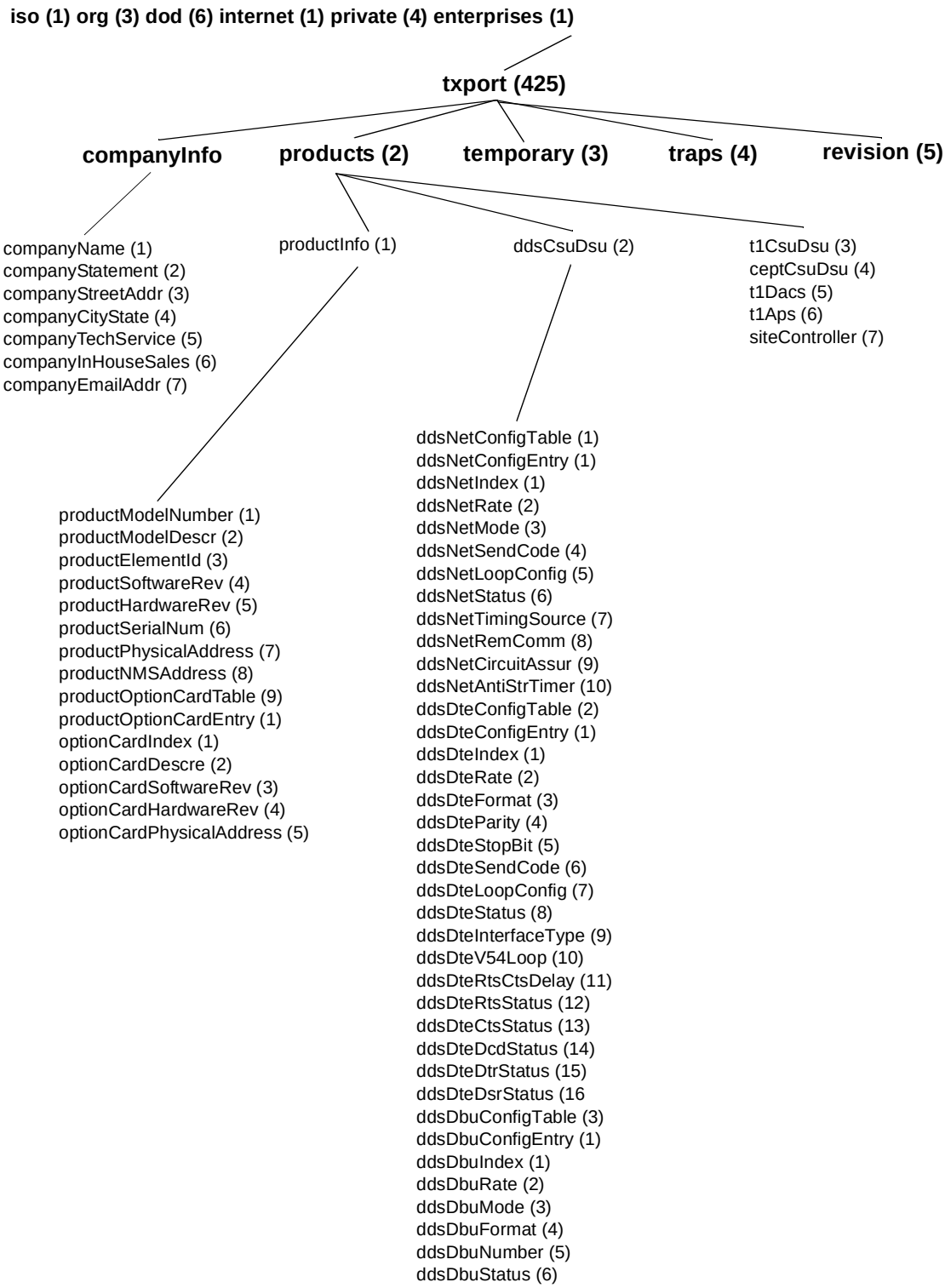
Table C-11

Cleared Near	Cleared Far	Alarm Near	Alarm Far	Description
Equipment Interface Traps (T1 DTE)				
4	54	104	154	Equipment CRCS threshold exceeded.
5	55	105	155	Equipment BPVS threshold exceeded..
6	56	106	156	Equipment AISS threshold exceeded.
7	57	107	157	Equipment YAS threshold exceeded.
8	58	108	158	Equipment UAS threshold exceeded.
9	59	109	159	Equipment OOFS threshold exceeded.
10	60	110	160	Equipment LOSS threshold exceeded.
11	61	111	161	Equipment CSS threshold exceeded.
12	62	112	162	Equipment SES threshold exceeded.
13	63	113	163	Equipment ES threshold exceeded.
Network Interface Traps (T1)				
14	64	114	164	Network CRCS threshold exceeded.
15	65	115	165	Network BPVS threshold exceeded.
16	66	116	166	Network AISS threshold exceeded.
17	67	117	167	Network YAS threshold exceeded.
18	68	118	168	Network UAS threshold exceeded.
19	69	119	169	Network OOFS threshold exceeded.
20	70	120	170	Network LOSS threshold exceeded.
21	71	121	171	Network CSS threshold exceeded.
22	72	122	172	Network SES threshold exceeded.
23	73	123	173	Network ES threshold exceeded.
25	75	125	175	Network OOS threshold exceeded.
28	78	128	178	Port DTR alarm
29	79	129	179	Port ASC alarm
30	80	130	180	Port OOS alarm
31	81	131	181	Port UMC alarm
32	82	132	182	Port TST alarm
33	83	133	183	Port Far-NET alarm
34	84	134	184	Port FAR-DTE alarm
35	85	135	185	Port FAR-Communications alarm
36	86	136	186	Port LOS alarm
37	87	137	187	Port FDL alarm

Table C-11

Cleared Near	Cleared Far	Alarm Near	Alarm Far	Description
Data Port Interface Traps				
201	401	601	801	Data Port 2A DTR Alarm (Port 1 on some units)
202	402	602	802	Data Port 2B DTR Alarm (Port 2 on some units)
203	403	603	803	Data Port 3A DTR Alarm (Port 3 on some units)
204	404	604	804	Data Port 3B DTR Alarm (Port 3 on some units)
205	405	605	805	Data Port 4A DTR Alarm
206	406	606	806	Data Port 4B DTR Alarm
207	407	607	807	Data Port 5A DTR Alarm
208	408	608	808	Data Port 5B DTR Alarm
209	409	609	809	Data Port 6A DTR Alarm
210	410	610	810	Data Port 6B DTR Alarm
Other Traps				
n/a	n/a	101	151	Power Failure
2	n/a	n/a	n/a	External Alarm
3	n/a	103	n/a	Communications Error (8100-specific trap)

TXPORT and DDS Object Identifier Tree



D ORDERING NUMBERS

Each PRISM 3030 unit is supplied with the following standard equipment:

- Attached 19-inch mounting brackets
- AC power supply cord for AC powered units
- PRISM 3030 reference manual

The Verilink PRISM 3030 may be purchased with the part numbers shown in Table D-1.

For example, the letter c is a variable for the voltage option. The default part number (F-3030-001--1111) is a 110 volt PRISM 3030 unit.

The PRISM products are usually shipped with the purchased items already installed. Additional modules may be purchased at any time and are easily installed to accommodate user requirement changes.

Table D-1 PRISM 3030 Ordering Numbers

F-3030-001--abcd	PRISM 3030 unit
a	Company
1	Verilink
3	Timeplex
b	Special Option
1	Standard Unit
2	RS-423 Station Clock
c	Voltage Option
1	110 VAC
2	220 VAC
4	−48 VDC
d	Protection Option
1	Standard Unit
2	Hardend Protection

Several interface modules are available for high-speed data, low-speed data, and voice. These modules have part numbers beginning with F-3010- as shown in Table D-2. Each module fits in Slots 2 and 3 on the 3030 unit.

Table D-2 PRISM 3030 Module Options

F-3010-100--abc	High-speed port interface
a	Company
1	Verilink
b	Special Option
1	Standard unit
c	Interface option
1	V.35/V.35
2	V.35/EIA-530
3	EIA-530/EIA-530
4	EIA-530/RS-232
5	V.35/RS-232
6	RS-232/RS-232
F-3010-200--abc	6-port voice module
a	Company
1	Verilink
b	Special Option
1	Standard Unit
c	Voice Option
1	2-wire FXS
2	4-wire E&M (Type I-III signalling)
3	2-wire FXO
4	4-wire E&M (Type I-V signalling)
	6-port voice module w/on-board signalling power
F-3010-200A-111	FXS voice module
F-3010-200A-113	FXO voice module
F-3010-300--abcd	Dual T1 DTE module
a	Company
1	Verilink
b	Special Option
1	Standard Unit
c	Module Option
1	Dual Port T1 DTE
d	Option
1	Standard Unit
F-3010-400--abcd	DDS DSU module
a	Company
1	Verilink
b	Special Option
1	Standard Unit
c	Module Option
1	Dual Port DSU
6	6-Port DSU (This unit can only be used with the F-3060-001--13xx 10 MHz unit.)
d	Option
1	Standard Unit
30-00087	−48 VDC power supply

Options are also available to provide the unit with a T1 DTE interface. This interface can be equipped with the Ethernet, SNMP, and Telnet management options or with the Token Ring, SNMP, and Telnet management options as shown in Table D-3. These modules have F-3011- part numbers and fit in Slot 1 only.

Table D-3 T1 DTE Options

F-3011-100--abcd	T1 DTE port
a	Company
1	Verilink
b	Special option
1	Standard Unit
c	T1 DTE/Ethernet Option
1	T1 DTE
2	Ethernet
3	T1 DTE/Ethernet
d	Software option
0	Not installed
F-3011-200--abcd	T1 DTE port
a	Company
1	Verilink
b	Special Option
1	Standard Unit
c	T1 DTE/Token Ring Option
2	Token Ring
3	T1 DTE/Token Ring
d	Software option
0	Not installed

The user may also require the equipment options shown in Table D-4 for the installation and operation of the PRISM unit.

Table D-4 Optional Equipment

Part Number	Description
NET/T1 DTE Cables	
9-1001-004	8-pin mod to 8-pin mod (4 twisted pairs)
9-1001-006-1	8-pin mod to 15-pin D-type adapter, male
9-1001-006-2	8-pin mod to 15-pin D-adapter, female
9-1001-051-1	T1 crossover kit, 1 ft
Supervisory Cables	
9-1001-027-1	DB-25 male to 6-pin mod (modem to SUPV)
9-1001-027-2	DB-25 female to 6-pin mod (modem to SUPV)
9-1001-028-1	DB-25 male to 6-pin mod (terminal to SUPV)
9-1001-028-2	DB-25 female to 6-pin mod (terminal to SUPV)
9-1001-029-2	DB-9 female to 6-pin mod (terminal to SUPV)
9-1001-048-1	DB-25 male to two 6-pin mod (terminal to NMS)
9-1001-048-2	DB-25 female to two 6-pin (terminal to NMS)
RS-232 Cables	
9-1001-044	Null modem male to male (RS-232)
9-1001-211	RS-232 straight through male to male cable
9-1001-212	RS-232 straight through female to male cable
V.35 Cables	
9-1001-001	V.35 male to male null cable
9-1001-311	V.35 male to male cable
9-1001-312	V.35 male to female cable
EIA-530 Cables	
9-1001-511	EIA-530 male to male cable
9-1001-511N	EIA-530 male to male null cable
9-1001-512	EIA-530 male to female cable
RS-449 Cables	
9-1564A-037-1	RS-449 male to EIA-530 male
9-1564A-037-2	RS-449 female to EIA-530 male
9-1564A-038-1	RS-449 to EIA-530 null cable, male to male
Voice Cables	
9-1001-010	50-pin voice cable, male to stub
9-1001-011	50-pin voice cable, male to male
9-1001-012	50-pin voice cable, male to female
Miscellaneous	
9-3060-028-1	Mounting brackets for 23-inch racks

PRISM 3030 Configuration Reference

Customer Location: _____

Circuit ID: _____

Date: _____ / _____ / _____

T1 NET CONFIGURATION

Framing Type: ESF D4

Line Coding: AMI B8ZS

Line Build Out: 0 dB −7.5 dB −15 dB −22.5 dB

Timing: INTERNAL NETWORK T1 DTE STATION SLOT 2A SLOT 2B SLOT 3A SLOT 3B

Station Input Timing: 1.544 MHz N×56K N×64K
(Timing must be set to Station in Timing menu)

Station Timing: _____ Enter a number from 1 to 24 to select the N multiplier for the Station Input Timing menu.

Zero Suppression: ENABLE DISABLE

PRM Enable: ENABLE DISABLE

Alarm Thresholds: (enter # of seconds)
ALARM RESET:___ ES:___ SES:___
LOSS: ___ OOFS: ___ UAS: ___
RAS: ___ AISS: ___ BPVS: ___

T1 DTE CONFIGURATION (if equipped)

Framing Type: ESF D4

Line Coding: AMI B8ZS

DSX Level (feet): 0–110 111–220 221–330
331–440 441–550 551–660 >660

Channel Assignment: IDLE THRU

DTE SLOT 2A

Port Rate Multiplier: N×64K N×56K DISABLE

Port Rate: _____ Enter a number from 0 to 24 to select the N multiplier for the Port Rate Multiplier menu.

Starting Channel #: _____ Enter a number from 1 to 24.

DS0 Channel Assign: CONTIGUOUS ALTERNATING

Port Transmit Clock: INTERNAL EXTERNAL OVERSAMPLED

Invert Data: NO YES

CTS Control: INTERNAL FORCE TRUE FORCE FALSE

DSR Control: INTERNAL FORCE TRUE FORCE FALSE

DCD Control: INTERNAL FORCE TRUE FORCE FALSE

V.54 Loop: ENABLE DISABLE

RS-232 Port Rate: (if equipped)
NONE SYNCHRONOUS 1200 2400
4800 9600 14400 19200 28800
38400 48000 56000 64000

DTE SLOT 2B

Port Rate Multiplier: N×64K N×56K DISABLE

Port Rate: _____ Enter a number from 0 to 24.

Starting Channel #: _____ Enter a number from 1 to 24.

DS0 Channel Assign: CONTIGUOUS ALTERNATING

Port Transmit Clock: INTERNAL EXTERNAL OVERSAMPLED

Invert Data: NO YES

CTS Control: INTERNAL FORCE TRUE FORCE FALSE

DSR Control: INTERNAL FORCE TRUE FORCE FALSE

DCD Control: INTERNAL FORCE TRUE FORCE FALSE

V.54 Loop: ENABLE DISABLE

DTE SLOT 3A

Port Rate Multiplier: N×64K N×56K DISABLE

Port Rate: _____ Enter a number from 0 to 24.

Starting Channel #: _____ Enter a number from 1 to 24.

DS0 Channel Assign: CONTIGUOUS ALTERNATING

Port Transmit Clock: INTERNAL EXTERNAL OVERSAMPLED

Invert Data: NO YES

CTS Control: INTERNAL FORCE TRUE FORCE FALSE

DSR Control: INTERNAL FORCE TRUE FORCE FALSE

DCD Control: INTERNAL FORCE TRUE FORCE FALSE

V.54 Loop: ENABLE DISABLE

RS-232 Port Rate: (if equipped)
NONE SYNCHRONOUS 1200 2400
4800 9600 14400 19200 28800
38400 48000 56000 64000

DTE SLOT 3B

Port Rate Multiplier: N×64K N×56K DISABLE

Port Rate: _____ Enter a number from 0 to 24.

Starting Channel #: _____ Enter a number from 1 to 24.

DS0 Channel Assign: CONTIGUOUS ALTERNATING

Port Transmit Clock: INTERNAL EXTERNAL OVERSAMPLED

Invert Data: NO YES

CTS Control: INTERNAL FORCE TRUE FORCE FALSE

DSR Control: INTERNAL FORCE TRUE FORCE FALSE

DCD Control: INTERNAL FORCE TRUE FORCE FALSE

V.54 Loop: ENABLE DISABLE

VOICE PORT (if equipped)

Slot 2A: Channel___, Mode____, Signalling___

Slot 2B: Channel___, Mode____, Signalling___

Slot 2C: Channel___, Mode____, Signalling___

Slot 2D: Channel___, Mode____, Signalling___

Slot 2E: Channel___, Mode____, Signalling___

Slot 2F: Channel___, Mode____, Signalling___

Slot 3A: Channel___, Mode____, Signalling___

Slot 3B: Channel___, Mode____, Signalling___

Slot 3C: Channel___, Mode____, Signalling___

Slot 3D: Channel___, Mode____, Signalling___

Slot 3E: Channel___, Mode____, Signalling___

Slot 3F: Channel___, Mode____, Signalling___

SNMP CONFIGURATION (if equipped)

Unit IP Address: _____ . _____ . _____

Router IP Address: _____ . _____ . _____

Trap IP Address
1: _____ . _____ . _____
2: _____ . _____ . _____
3: _____ . _____ . _____
4: _____ . _____ . _____
5: _____ . _____ . _____
6: _____ . _____ . _____

Read Community: _____

Write Community: _____

System Contact: _____

System Name: _____

System Location: _____

SYSTEM UTILITIES

Edit Password: _____ (up to 10 characters)

NMS Address: _____ (select a number from 1 to 250)

NMS Bit Rate: 19200 9600 4800 2400 1200

Supv Bit Rate: 19200 9600 4800 2400 1200

Boot Mode: LOCAL NMS

Alarm Cut Off: DISABLE ENABLE

Remote Link: FDL NONE CHANNEL ___ (from 1 to 24)

Call on Alarm:

Primary #: _____ (up to ___ characters)

Secondary #: _____ (up to ___ characters)

Element ID: _____ (up to 29 characters)

Alarm Notification: OFF DIRECT DIAL DIAL NMS

Remote Link FDL NONE Channel ___ (from 1 to 24)

Affidavit for the Connection of Customer Premises Equipment to 1.544 Mbps and/or Subrate Digital Services

For work to be performed in the certified territory of

Telco's Name: _____

State of: _____

County of: _____

I, _____, of _____,
(Name Authorized Representative) (Customer Name)

_____, _____,
(Customer Address) (Telephone Number)

being duly sworn, state:

I have responsibility for the operation and maintenance of the terminal equipment to be connected to _____1.544 Mbps and/or _____ subrate digital services. The terminal equipment to be connected complies with Part 68 of the Commissions rules except for the encoded analog content and billing protection specifications. With respect to encoded analog content and billing protection:

- I attest that all operations associated with the establishment, maintenance and adjustment of the digital CPE with respect to encoded analog content and encoded billing information continuously complies with Part 68 of the FCC's Rules and Regulations.

- The digital CPE does not transmit digital signals containing encoded analog content or billing information which is intended to be decoded within the telecommunications network.

- The encoded analog and billing protection is factory set and is not under the control of the customer.

I attest that the operator(s) maintainer(s) of the digital CPE responsible for the establishment, maintenance and adjustment of the encoded analog content and billing information has (have) been trained to perform these functions by successfully completing one of the following: Check appropriate ones(s).

❑ A. Training course provided by the manufacturer/grantee of the equipment used to encode analog signals; or

❑ B. Training course provided by the customer or authorized representative, using training materials and instructions provided by the manufacturer/grantee of the equipment used to encode analog signals; or

❑ C. Independent training course (e.g., trade school or technical institution) recognized by the manufacturer/grantee of the equipment used to encode analog signals; or

❑ D. In lieu of the proceeding training requirements, the operator(s) maintainer(s) is(are) under the control of a supervisor trained in accordance with _____above.

I agree to provide _____ with proper documentation to
(Telco's Name)
demonstrate compliance with the information as provided in the proceeding paragraph, if so requested.

_____ (Signature)

_____ (Title)

_____ (Date)

Subscribed and Sworn to before me this _____day of _____, 19____.

_____

Notary Public

My Commission expires: _____

Two-Year Hardware Limited Warranty

I. Limited Warranty. Subject to the limitations and disclaimers set forth in this Hardware Limited Warranty, Verilink warrants to the original purchaser ("Buyer") that the Verilink equipment and component parts ("Goods") purchased by Buyer shall be free from defects in material and workmanship under normal use and service for a period of two years from the date of shipment of the Goods to Buyer ("Limited Warranty"). Verilink's sole obligation and Buyer's sole remedy under this Limited Warranty shall be to repair or replace any Verilink Goods that Verilink determines to be so defective. Any claim by Buyer under this Limited Warranty must be presented to Verilink in writing within two years and fifteen (15) days of the date of shipment of the Goods to Buyer, as evidenced by Verilink's packing slip or similar shipment documentation from a Verilink authorized reseller. Any replacement Goods may be new or reconditioned. Verilink reserves the right to substitute equivalent Goods for defective Goods, in its sole discretion. As long as Verilink either so repairs or replaces the Goods, this Limited Warranty will not be found to have failed its essential purpose. If the defect has been caused by accident, misuse, or abnormal operating conditions (including lightning damage) occurring after delivery to Buyer, repairs and/or replacement will be made at Buyer's expense. In such event, an estimate of cost will be submitted to Buyer before repair work is started. The Limited Warranty will continue to apply to replaced or repaired Goods whichever is longer: the 90-day period after the shipment of such Goods to Buyer or the remainder of the original Limited Warranty period.

II. EXCLUSION OF IMPLIED WARRANTIES OR OTHER REPRESENTATION. THE GOODS ARE SOLD BY VERILINK "AS IS" WITHOUT ANY WARRANTY OR GUARANTEE OF ANY KIND OTHER THAN THE LIMITED WARRANTY SET FORTH ABOVE, WHICH IS MADE EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, AND VERILINK HEREBY DISCLAIMS ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NONINFRINGEMENT, AND ALL OTHER IMPLIED WARRANTIES ON THE PART OF VERILINK. VERILINK DOES NOT WARRANT THAT THE BUYER'S USE OF THE GOODS WILL BE UNINTERRUPTED, SECURE, OR ERROR-FREE. Buyer agrees that no oral or written representation, advice, advertisement or other statement by Verilink, its reseller, agent, employee, or representative constitutes any warranty, guarantee or modification of the foregoing disclaimer and Limited Warranty, and Buyer acknowledges that no person, including resellers, agents, employees, or representatives of Verilink, is authorized to assume for Verilink any other liability on its behalf except as set forth in this paragraph.

III. LIMITATION ON LIABILITY. IN NO EVENT SHALL VERILINK, ITS OFFICERS, DIRECTORS, EMPLOYEES, OR SUPPLIERS BE LIABLE FOR SPECIAL, CONSEQUENTIAL, EXEMPLARY, INCIDENTAL, OR PUNITIVE DAMAGES (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF PROFITS, BUSINESS INTERRUPTION, DATA LOSS, DAMAGE TO EQUIPMENT, OR THE LIKE), REGARDLESS OF WHETHER THE CLAIM IS BASED ON BREACH OF WARRANTY, BREACH OF CONTRACT, STRICT LIABILITY, OR OTHER LEGAL THEORY, EVEN IF VERILINK OR ITS AGENT WAS ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT WILL VERILINK'S LIABILITY TO BUYER OR ANY SUCCESSOR TO BUYER EXCEED THE PRICE PAID FOR THE APPLICABLE GOODS.

IV. LIMITED WARRANTY CONDITIONS. The Limited Warranty shall be void (i) with respect to any Goods that have been repaired or altered outside Verilink's factory, unless Verilink specifically authorized such repairs or alterations; (ii) in the event parts not made or recommended by Verilink are used by Buyer in the Goods; or (iii) if the Goods are used by Buyer other than in the manner intended by Verilink or other than in conformance with operating instructions and specifications provided by Verilink.

V. MODIFICATIONS BY VERILINK. Minor deviations from specifications that do not materially affect performance of the Goods covered hereby, as mutually agreed upon by Verilink and Buyer, shall not be deemed to constitute a breach of the Limited Warranty. Verilink also reserves the right to discontinue Goods and change specifications for Goods without notice, provided such changes do not adversely affect the performance of the Goods manufactured by Verilink or do not reduce performance below any applicable contract specifications between Verilink and the Buyer. Verilink also reserves the right to make product improvements without incurring any obligations or liability to make the same changes in Goods previously manufactured or purchased. Non-payment of any invoice rendered within the stated payment terms automatically suspends the application of, but not the running of, the Limited Warranty for the duration of the non-payment.

VI. AMENDMENT OF WARRANTY TERMS. These terms and conditions of this Hardware Limited Warranty may be revised by Verilink from time to time in its sole discretion. The terms and conditions in effect at the time of purchase will apply to such Goods.

VII. RETURN OF GOODS. If for any reason the Buyer must return a Verilink product, it must be returned to the factory, shipping prepaid, and packaged to the best commercial standard for electronic equipment. Verilink will pay shipping charges for delivery on return. The Buyer is responsible for mode and cost of shipment to Verilink. The Buyer must have a Return Material Authorization (RMA) number marked on the shipping package. Products sent to Verilink without RMA numbers will be returned to the sender, unopened, at the sender's expense. A product sent directly to Verilink for repair must first be assigned a Return Material Authorization (RMA) number. The Buyer may obtain an RMA number by calling the Verilink Customer Service Center at 1.800.926.0085, extension 2282 or 2322. When calling Verilink for an RMA, the Buyer should have the following information available:

- · Model number and serial number for each unit
- · Reason for return and symptoms of problem
- · Purchase order number to cover charges for out-of-warranty items
- · Name and phone number of person to contact if Verilink has questions about the unit(s).

A return address will be provided at the time the RMA number is issued. The standard delivery method for return shipments is Standard Ground for domestic returns and International Economy for international returns (unless otherwise specified).

VIII. GOVERNING LAW. This Agreement is governed by the laws of the State of Alabama, U.S.A., without reference to its conflicts of law provisions. The provisions of the UN Convention on Contracts for the International Sale of Goods shall not apply.